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1—APPARATUS AND PLANT EQUIPMENT

W. L. BADGER

A bakelite product for apparatus construction. WALTER PETERS. *Apparatebau* **38,** 195-6(1926).—"Resit" (Bakelite C) and "Haveg" (*C. A.* **19,** 3039) are discussed. J. H. MOORE

Vacuum cooling. K. THORMANN. *Chem App.* **13,** 201-2(1926), 3 cuts.—Description of the Sauerberg app for cooling satd. solns. by flash evapn., with recovery of 60-70% of the heat. J. H. MOORE

A bath for observations at lower temperatures. W H. PATTERSON. *Phil Mag.* [7] **2,** 383-4(1926).—An alc. bath contd. in a Dewar flask is provided with a stirrer and a tube contg. a pentane thermometer and the liquid under examn for its congealing point or "setting range." Heat can be supplied at will by a heating coil and refrigeration is provided by blowing small quantities of liquid air on to cotton-wool in the cooling tube. A given low temp. range can thus be explored with any desired rate of drift. S. C. L.

Water separator for high-pressure steam. TH. HOFFMANN. *Chem. App* **13,** 188-9(1926); 2 cuts. J. H. MOORE

A simple automatic cryostat. HEIMA SINOZAKI AND RYOSABURO HARA. *J. Soc. Chem. Ind. Japan* **29,** 262-5(1926).—An automatic cryostat is described Its principal features are automatic function, small consumption of liquid air and simplicity. The vol. change of liquid pentane in the automatic regulator sets a Hg column, and consequently an elec. relay, in motion. This motion of the relay closes or breaks the elec. current of the coil of a small electromagnetic plunger valve, and sharply increases or reduces the pressure in a liquid-air reservoir This pressure change accelerates or retards the current flow of liquid air through a vacuum-jacketed tube into the cryostat bath in a manner similar to Henning's hand-regulating cryostat (*Z Instrumentenkunde* **33,** 33(1913)). Details of the construction are given with a diagram. The temp. is automatically kept const. to ±0.02° or ±0.03° within the range 0–150°. About 3 l. of liquid air are consumed to cool down the cryostat of about 1100-cc capacity from several degrees under zero to −100° and to maintain it at this temp for nearly 30 hrs. Also in *Tech. Repts. Tohoku Imp. Univ* **6,** 121-7(1926). K KASHIMA

A photographic goniometer. SIEGFRIED ROSCH. *Beitr Kryst Min.* **3,** 105-12 (1925) —A camera is attached to a 2-circle goniometer so that records of a group of crystal face-reflections can be made directly. E. T. WHERRY

Corrosion of iron pipes by water in economizers. ANON. *Apparatebau* **38,** 210-11(1926) J H. MOORE

A focusing x-ray spectrograph for low temperatures. KARL HOROVITZ. *Science* **64,** 303(1926). E. H.

Mobile x-ray equipment. ANCEL ST. JOHN. *Iron Age* **118,** 783(1926).—For tech. work, as the examn. of metals. E. J. C.

A surface-tensiometer and an osmometer for class work. F. E. LLOYD AND G W. SCARTH *Science* **64,** 253-4(1926).—Inexpensive app are described using the ring method with a chainomatic balance (cf. *C A.* **20,** 2604) to measure surface tension, and tubes provided with a $Cu_2Fe(CN)_6$ (in gelatin) membrane to measure osmotic pressure. J. E. SNYDER

The life-testing of small thermionic valves. M. THOMPSON, R. H. DUDDERIDGE AND L. G. A. SIMS. *J. Inst. (Brit.) Elec. Eng.* **64,** 967-85(1926). C. G. F.

KRAUSE, HUGO: **Maschinenkunde für Chemiker.** Brunswick: F. Vieweg & Sohn A.-G. 436 pp. R. M. 19, bound R. M. 22.

Acetylene generator. A. MESSER. U. S. 1,600,192, Sept. 14.

Acetylene generator. D. Blazina. Brit. 241,313, July 28, 1924.

Thermostat. G. W. Donning and D. A. Donning. U. S. 1,598,677, Sept. 7.

Thermostat. C. R. Carpenter. U. S. 1,599,208, Sept. 7.

Thermostat. F. Kraemer. U. S. 1,600,342, Sept. 21.

Thermometer for indicating temperatures at a distance. J. T. Fox and A. J. Malone. U. S. 1,598,571, Aug. 31.

Heat interchange apparatus. J. P. Fisher. U. S. 1,597,678, Aug. 31.

Surface condenser. G. W. Saathoff. U. S. 1,597,695, Aug. 31.

Heater and evaporator system for treating liquids. H. Fothergill. Brit. 241,671, Sept. 4, 1924.

Preheating or recuperative apparatus for gases. F. A. Fahrenwald. U. S. 1,599,613, Sept. 14.

Apparatus for separating a gas from a mixture of gases. E. B. Miller. Can. 258,025. Feb. 9, 1926. App. comprises a conduit; means to feed finely divided porous solid gas-adsorbing material into the conduit so that a flow of gases will be carried along by the material in suspension; means to sep. the material from the gases and to activate it, after which it is cooled, the vapors given off being condensed and recovered; and means to return the adsorbent to the feeding means, the means being so connected that the material moves in a continuous closed cycle. Cf. *C. A.* **20**, 1678.

Apparatus for liquefaction of air or other gases and rectification of their constituents. A. Seligmann. U. S. 1,599,681, Sept. 14.

Apparatus for treating gases with reagents for dehydration or other purposes. Metropolitan-Vickers Electrical Co., Ltd. Brit. 241,547, Oct. 14, 1924.

Apparatus for carbonating liquids. P. W. Shields and L. De Markus. U. S. 1,598,787, Sept. 7.

Apparatus for distillation of carbonaceous and other materials for determining amount and character of volatile constituents, etc. H. Nielsen and B. Laing. Brit. 241,659, Aug. 20, 1924.

Apparatus for filtration and settling of pulps, etc. Cycle Co. Brit. 241,453, March 23, 1925

Apparatus for ore flotation or for other treatments of liquids with gases. W. E. Greenawalt. U. S. 1,598,858, Sept. 7.

Generator for hydrogen sulfide, carbon dioxide or other gases produced by reaction between solids and liquids. B. B. Annis. U. S. 1,598,108, Aug. 31.

Viscometer. G. G. Stoney and R. O. Boswall. Brit. 241,652, Aug 12, 1924.

Apparatus for comparing the viscosity of oil samples. J. D. Sartakoff. U. S. 1,600,250, Sept. 21.

Apparatus for drying and heating "lithophone green cake" or other wet materials. W. G. Graves. U. S. 1,599,467, Sept. 14.

Apparatus for desiccating milk, eggs or other liquids in vacuum. C. O. Lavett. U. S. 1,597,809, Aug. 31.

Thermionic valves. Westinghouse Electric & Manufacturing Co. Brit. 241,556, Oct. 14, 1924. H_2O vapor is introduced into thermionic discharge devices to improve the electron emission from the cathode. Alk. earth hydroxides or oxides or bentonite may be used as the medium for introduction of the H_2O vapor during the manuf. of the device and part of the tubulature during manuf. may be cooled by CO_2 snow to insure retention of some of the H_2O present during exhaustion of the bulb.

Filaments of thermionic valves. General Electric Co., Ltd. and C. J. Smithells. Brit. 241,304, July 23, 1924. Filaments of metals such as W, Mo or Fe are coated with CaO or other electron-emitting material which is held in place by associating it with an oxide of the metal forming the filament and reducing the oxide after application of the coating.

Thermionic valves and similar apparatus. Westinghouse Electric & Manufacturing Co. Brit. 241,548, Oct. 14, 1924 A pyrophoric metal is used for absorbing gas in a discharge tube or other container. A finely divided reactive metal may be obtained for the purpose by heating formate, oxalate, acetate or other org. compd. of Fe, Co or Ni, preferably assocd. with a similar org. salt of Mg or with lime or other Ca compd.

Röntgen-ray apparatus. H. v. Dechend. U. S. 1,599,989, Sept. 14.

X-ray apparatus. J. B. Wantz. U. S. 1,599,696, Sept. 14.

X-ray apparatus. J. S. Rose. U. S. 1,599,434, Sept. 14.

X-ray apparatus. H. A. Mulvany and H. E. Kennedy. U. S. 1,598,150, Aug. 31.

X-ray apparatus. H. F. Waite. U. S. 1,598,901, Sept. 7.

X-ray apparatus. W. D. Coolidge. U. S. 1,600,867, Sept. 21.

X-ray apparatus. W. Meyer. U. S. 1,600,598, Sept. 21.

2—GENERAL AND PHYSICAL CHEMISTRY

GEORGE L. CLARK AND BRIAN MEAD

The work of Marcelin Berthelot (1827–1907). CAMILLE MATIGNON. *Chimie et industrie* **16,** 145–9(1926).—Outline of Berthelot's accomplishments in the 4 following fields: prepn. of synthetic org. compds., study of the forces governing chem. combinations and decompns., agricultural chemistry, history of chemistry. A. P.-C.

Joseph von Fraunhofer; on the centenary of his death, June, 7, 1926. ANON. *Apparatebau* **38,** 204–6(1926).—Historical. J. H. MOORE

Hermann Ambronn. ALBERT FREY. *Kolloidchem. Beihefte* **23,** 1-5(1926).—A brief biography, with portrait. E. J. C.

The life and work of Albin Haller. PAULINE RAMART. *Bull. soc. chim.* **39,** 1037–92(1926).—An obituary, with portrait and bibliography. E. J. C.

Kunckel's discovery of fulminate. T. L. DAVIS. *Army Ordnance* **7,** 62–3(1926). CHARLES E. MUNROE

Methods of physico-chemical research at high temperatures. F. M. JAEGER. *Bull. soc. chim. Belg.* **35,** 213–29(1926).—A lecture describing methods of conductivity detns., surface tension measurement, etc., at high temps. W. B. PLUMMER

Search for element No. 61. WILHELM PRANDTL. *Z. angew. Chem.* **39,** 897–8 (1926).—Skeptical criticism, based on P.'s own experience in the same quest (*C. A.* **18,** 2983), of the work of Hopkins and others (*C. A.* **20,** 2600). Detailed criticism is made of the published proofs of discovery. NORRIS F. HALL

The element 61 (illinium). R. J. MEYER, G. SCHUMACHER AND A. KOTOWSKI. *Naturwissenschaften* **14,** 771–2(1926).—The authors' review work done since 1920 on isolation of element 61 (cf. Schumacher, Dissertation, Berlin 1921). On fractional crystn. of the bromates the Il tends to conc. in the less sol. fractions (method of James, *C A* **2,** 962). Further concn. was attained by fractionation of the Mg double nitrates with addn. of Mg-Bi double nitrate (method of Urbain and Lacombe, *Compt. rend.* **138,** 1166(1904)). The success of the x-ray spectrography is particularly due to the use of the K series instead of the L series for the identification. B. J. C. VAN DER HOEVEN

Estimating atomic weights with the aid of the periodic law. E. W. WASHBURN. *J Am. Chem. Soc* **48,** 2351–2(1926)—The ratio of the at. wt. of each element to that of the next preceding (also succeeding) zero-group element is computed. The ratio of the corresponding at. nos. is also obtained, and the difference between these two ratios is plotted against the at. nos. of the elements. The loci of the points for the elements whose at wts. have not been detd. exptly. can be estimated from the graphs, and the missing at. wts. computed by reversing the calcn. A table is given of such at. wts. thus calcd. R. H. LOMBARD

The crystal structure [of carbon compounds]. A. NOLD. *Z. Krist.* **62,** 127–37(1925).—N. discusses possible space models for C compds. L. S. RAMSDELL

Crystal structure. I. Symmetrical grouping of discontinuous point distribution. II. Atom groups in crystals and their physical significance. K. WEISSENBERG. *Z. Krist.* **62,** 13–51, 52 102(1925).—A discussion of homogeneous discontinuity. Tables show the relations of the various point groups, the degrees of freedom (in regard to position of point), and the number of unsymmetrical particles necessary to build a symmetrical structure. Examples are given from known crystal structures of both org.. and inorg. compds. L. S. RAMSDELL

X-rays and organic compounds with long chains—spectrographic researches upon their structures and their orientations. J. J. TRILLAT. *Ann. phys.* **6,** 5–101(1926).—A masterly memoir presenting in detail the exptl results reported in a series of papers in *Compt. rend.* during the past 2 years (*C. A.* **19,** 1072, 2150, 2299, 2326, 2764; **20,** 706, 2065). Under the heading physical study are presented the factors which influence orientation of long chains (so as to form reflecting layers) on glass (moisture, acidity, thickness and rapid crystn. are detrimental), and the effects of cryst., amorphous and metallic supports. The last in some cases give the spectra of soaps formed between fatty acid layers and metal. In the chem. study are included precision studies of the satd. fatty acids proving that even and odd series fall on 2 distinct curves representing spacing as a function of no. of C atoms; of diacids; of soaps (excellent results from the action of acids on Pb), including accurate identification of unknown acids (margaric = $C_{16} + C_{18}$, daturic = C_{17}, arachidic = C_{23}) and the direct measurement of the largest

reticular distance, 92 A U.; of greases and waxes; and of the course of chem reactions, such as absorption of O at double bonds of soaps formed from unsatd. acids.

GEORGE L. CLARK

A study of the vitreous state through enforced crystallization. I. F. PONOMAREV. *Z. anorg. allgem. Chem.* **155**, 281 90(1926) —Glass subjected to very slow cooling crystallizes in hexagonal prisms. The temp and velocity of crystn were detd. for various glasses

MARIE FARNSWORTH

Crystal structure of beryllium oxide. W. H ZACHARIASEN. *Norsk Geol. Tids-skrift* **8**, 189 200(1925), *Mineralog Abstracts* **3**, 20 —BeO was found by the x-ray powder method to be hexagonal with space group C_{6v}^4 The unit cell contains 2 mols. The cubic form could not be obtained (Cf *C A* **20**, 1925and Aminoff, *C. A* **20**, 29.)

J F. SCHAIRER

Crystal structure of red mercuric iodide. J. M BIJVOET, A CLAASSEN AND A KARSSEN. *Proc Acad Sci Amsterdam* **29**, 529 16(1926). (In English.)—See *C. A.* **20**, 2264.

E. H.

The crystalline structure of perovskite. G R. LEVI AND G NATTA. *Atti accad. Lincei* [6] **4**, 54(1926) - Corrections of crystallographic data (cf *C. A* **20**, 526).

C C. DAVIS

The symmetry of sylvite and the nature of the etch figures. K F. HERZFELD AND A HETTICH *Z Physik* **38**, 1 -7(1926) - The ordinary hemihedry of sylvite which is apparent from the unsymmetry of the etch figures is not to be ascribed to the peculiarities of sylvite but to org impurities The etch figures of the highly purified crystals are perfectly holohedral Etch nodules result only where the surfaces are covered by difficultly sol. substances

GEORGE L. CLARK

The crystallography and optical properties of bromotyrosine. W. R ZARTNER. *Z. Krist* **62**, 141 5(1925) - -Crystals of bromotyrosine are orthorhombic, similar to those of chlorotyrosine Double refraction strong, optically negative, $2E = 68° 36'$, $v > r$, $\gamma = 1.632$

L S RAMSDELL

Tensile tests of large gold, silver and copper crystals. C F. ELAM *Proc Roy. Soc.* (*London*) **112A**, 289-96(1926) Large crystals of the metals were prepd by Davey's modification (*Phys Rev* **25**, 248) of Bridgman's method, and tensile strength tests made. Orientation of crystals were detd by x-rays initially, and at stages during extension. Tables of loads, areas, shears and crystal axes are given The metals whose atoms are nearest together show a greater proportional increase in hardness of deformation

R. W. RYAN

The resistance to compression of ice. FIRMA KRYSTALISVAERKET COPENHAGEN. *Z. ges Kalteind* **33**, 84-5(1926) - The resistance to compression of ice prepd from distd. and deaerated water was detd. The temp of the ice was -3°, of the lab 10° and the testing app was cooled by ice before use Single ice pieces 19 × 19 × 19 cm. withstood 10 kg /sq cm on an av. Composite specimens, built together from 4 pieces so as to give ice specimens approx 38 × 38 × 45 cm. and tested on the plane 38 × 45 cm. withstood approx 5 kg /sq cm Some cracks appeared at lower pressures. The results are considered not accurate because the ice surfaces were neither smooth nor parallel

D. THUESEN

Thermal investigation of electrolytic lead. Allotropy of lead. A. TRAVERS AND HOUOT. *Compt rend* **183**, 359-61(1926).—Examn. with a Chevenard differential dilatometer of a sample of electroyltic Pb contg Fe 0.025, Cu 0 010, Mn 0.005, Sn 0.17%, Sb nil, gave the following results. the freshly cast metal on heating in the dilatometer contracts to the extent of about 0 15%; metal which has been cast in chill molds and then annealed 24 hrs at 240° exhibits no contraction; attempts to harden at 300° the annealed bar in the instrument itself (by pouring brine at -10° on the quartz tube contg. the test piece) were unsuccessful; according to the past thermal treatment of the metal the expansion curve shows either one angle (at about 60°) or two angles (at about 60° and 180°). Testing the bar as cast within 4 hrs gives a curve with 2 angles, testing the bar 8 days after casting or after annealing 30 hrs at 160° gives a curve with only 1 angle, while if the annealing is carried out above 180° (actually done at 240°) the curve again has 2 angles. T and H. interpret these results as follows: (1) the purest Pb obtainable still contains impurities, some of which (*e. g* , Sn) give solid solns. with the pure metal, and as the diagram is such that on heating transition is made from the 2-phase to the single-phase zone it follows that the quenched metal consists of only 1 phase (solid soln), while annealing ppts out the dissolved constituent and at the same time the alloy contracts; (2) the existence of 2 breaks in the expansion curves is due to the existence of 3 allotropic modifications of Pb, γ which is stable above 180°, and α and β both of which are stable at lower temps., transformation of one variety into

another taking place with variation in the expansion coeff. but without anomalous expansion. A. PAPINEAU-COUTURE

The isotherms of helium, hydrogen and neon below —200°. L. HOLBORN AND J. OTTO. *Z. Physik* **38,** 359–67(1926); cf. *C. A.* **19,** 3184.—The previous measurements of the isotherms at 100 atm. have been extended to —208°. The isotherms of He at —252.8° and —258.0° have also been obtained. Corrections for the gas thermometer to the thermodynamic scale have been derived, which now afford reliable gas thermometer data from +400° to —260°. J. H. PERRY

The calculation of boiling point curves of binary mixtures. L. FRANK. *Z. komp. u flüssige Gase* **25,** 65–6(1926); cf. *C. A.* **19,** 2289.—The $T-x$ curves of many mixts. can be calcd. from the equation. $T = (b_1T_1x^2 + A_tx(1-x) + b_2T_2(1-x)^2)/(b_1x^2 + 2b_{12}x(1-x) + b_2(1-x)^2)$, where b_1 and b_2 are the van der Waal's vol consts., and T_1, T_2 are the b. ps. of the pure components; x is the mol. % of the first component in the liquid, and b_{12} is found by the equation: $2\sqrt[3]{b_{12}} = \sqrt[3]{b_1} + \sqrt[3]{b_2}$. A_t can be directly calcd. from the b, T values of the pure components, provided the curvature of the T-, x-curves is slight. To do this, it is necessary to start with the P-, x-curve of the mixt., which can be directly calcd. from the vapor pressures (P_1 and P_2) of the pure components and their b values. The P, x curves have the equations. $P = (b_1{}^2P_1x^2 + A_px(1-x) + b_2{}^2P_2(1-x)^2)/(b_1x^2 + 2b_{12}x(1-x) + b_2(1-x)^2)^2$, where A_p is given by the equations: $A_p(1-2x-mxn) = P_2b_2{}^2n^2(2+mn)-P_1b_1{}^2x^2(2-mx)$; $m(b_1x^2 + 2b_{12}xn + b_2n^2) = 4(b_1x + b_{12}(1-2x)-b_2n)$, $x = P_2/(P_1+P_2)$; $n = P_1/(P_1+P_2)$. To calc A_t of the first equation temp. T_s is chosen such that $2T_s \sim T_1 + T_2$, and in the third equation set $P = 760$, and for P_1 and P_2 their corresponding T_s values. Then equations 3 and 1 have a common point corresponding to T_s and can be solved for x. The whole calcn is naturally very tedious. Most examples, however, gives results within 5% correct, although there are many mixts. to which the calcn cannot be applied. R. L. D.

Increasing the alcohol content of alcohol-water vapors by separation of condensates. ANON. *Apparatebau* **38,** 197–8(1926). J. H. MOORE

The properties of surface films on liquids. N. K. ADAM. *Chem. Reviews* **3,** 163–97(1926).—A comprehensive review. A bibliography is appended. R. L. D.

The measurement of surface tension with the balance. AGNES POCKELS. *Science* **64,** 304(1926). E. H.

Equation of state of solid substances in connection with the general expression of energy. J. J. VAN LAAR. *Proc. Acad. Sci. Amsterdam* **29,** 497–514(1926). (In English.) See *C. A.* **20,** 2603. E. H.

Stability of suspensoids under the influence of electrolyte mixtures. H. R. KRUYT AND P. C. VAN DER WILLIGEN. *Proc. Acad. Sci. Amsterdam* **29,** 484–91(1926). (In English.)—See *C. A.* **20,** 1741. E. H.

Effect of adsorbents upon surface tension. L. JENDRASSIK. *Biochem. Z.* **169,** 178–85(1926).—If to an aq. soln. of a colloid or crystalloid is added filter paper, the surface tension, as measured by the ring method, is lowered, but, as measured by the stalagmometer, is unchanged. Therefore, the physical condition of the soln. and perhaps also the concn. of substances in the surface layer are changed by adsorbents. W. D. L.

The chemical nature of adsorption. K. C. SEN. *Biochem Z.* **169,** 192–9(1926); cf. *C. A.* **19,** 2291.—From the greater degree of adsorption by suspensoids such as $Cr(OH)_3$, $Al(OH)_3$, $Fe(OH)_3$ and $Ni(OH)_2$, of ions having acid rather than basic nature, the influence of the chem. nature of the adsorbent upon adsorption is shown. W. D. L.

The adsorption of water vapor on a plane fused quartz surface. The isosteric heats of adsorption of water on silica and on platinum. SAM LENHER. *J. Chem. Soc.* **1926,** 1785–92.—The adsorption of H_2O vapor at pressures near the satn. values at temps. between 290.8° K and 313° K. on a plane surface of quartz was measured. Adsorption of this type appears to start at a finite pressure. The silica and alkali content of glass surfaces are important in the formation of the H_2O film on glass. Calcns were made of the free energy changes accompanying the adsorption of H_2O vapor on quartz and also of the isosteric heats of adsorption at const. pressure of H_2O vapor on quartz and on Pt at different temps. and for different amts. adsorbed. M. F.

Experimental researches on the adsorption of dissolved substances. I. Study of certain adsorption phenomena. ANDRÉ CHARRIOU. *J. chim. phys.* **23,** 621–47 (1926).—By studying the effects of varying concns. of $CaCl_2$, NH_4OH and NH_4NO_3 upon the adsorption of CaO by Fe_2O_3 when the latter is pptd. by NH_4OH, C. has established the following hypothesis: The adsorption is a function of the quantity of CaO liberated in soln. by the hydrolysis of $CaCl_2$. No evidence of the formation of a *cal-*

cium ferrite was obtained. The exponential formula of Freundlich does not apply. When Al_2O_3 is pptd. by NH_4OH in solns. of K_2CrO_4 and $(NH_4)_2SO_4$ separately the ppt. adsorbs the free acids only, in direct proportion to their concn. in the soln.; the basic portion remains in soln. Freundlich's formula is applicable here as well as in the case of the adsorption of KOH by humic acid. In the presence of $CaCO_3$ the adsorption of KOH from KCl solns. is greatly enhanced. The amt. of KOH adsorbed from solns. of K_2CO_3 and $KHCO_3$ is a function of the hydrolysis of these salts. In studying the adsorption of alk. earth oxides and MgO by Al_2O_3 and Fe_2O_3 when the latter are obtained by the ignition of the nitrates, C. found that the lower the temp. of ignition the smaller the amt. of adsorbed oxides; for a given temp. the amt. of MgO adsorbed exceeds that of the other oxides and Fe_2O_3 has the greater adsorbing power. The applications of these results to *analytical chemistry* are given. E. R. Schierz

The adsorption of iodine by various substances. A. Lottermoser and Ludwig Herrmann. *Z. physik. Chem.* **122,** 1–27(1926).—The addn. of I_2 to basic La acetate follows an adsorption isotherm. The adsorptive power of the salt is a function of its age, and the adsorption process acts as a deterrent to further aging. The resulting blue color is dependent on the aging and, therefore, on the extent of the crystal surfaces. Lecithin-albumin also shows the above characteristics. KI is adsorbed by neither substance. Küster's hypothesis, that cholic acid forms a chem. compd. with I_2, was substantiated. I_2 added to a suspension of $Ca(OH)_2$ in CCl_4 forms a chem. compd., the rate of formation rising rapidly with increased H_2O concn. of the hydrate. CaO gives adsorption isotherms with I_2 in CCl_4 solns. $CaCO_3$ shows no adsorption.
C. H. Greenewalt

Adsorption on large molecules in solution. Marinesco. *Compt. rend.* **182,** 1149–51(1926).—By applying Einstein's equation for the viscosity of fine suspensions (*C. A.* **5,** 2995) to solns. of rhodamine B in H_2O and various mono-alcs. it was found that each of the dissolved mols. is surrounded by a mono-mol. layer of solvent mols. The polarity of the solvent mols. plays an important part in the nature of the monomol. layer. The solns. used were of concns. between 0.3 and 8%. The viscosities were measured with an Ostwald capillary in a thermostat. The solvents were H_2O, EtOH, Pr alc., iso-Pr alc., Bu alc., iso-Bu alc., Am alc., iso-Am alc., MeOH. In the presence of certain ions (3% NaOH) the solvent mols. are no longer adsorbed, as shown by measurements on solns. of fluorescein in H_2O, glycerol and mixts. R. L. Dodge

Adsorbent properties of cellulose compounds. J. Duclaux. *Rev. gén. colloides* **4,** 137–42(1926).—Nitrocellulose membranes have a very high adsorbing power for many substances, especially dyes and coloring substances. Such membranes have the advantages of low ash and inertness as compared to silica, alumina or charcoals. In general such membranes may be considered to be negatively charged and adsorb basic dyes strongly and acid dyes very slightly. Caramel is strongly adsorbed in an acid, and not at all in an alk. medium. A series of membranes may be used for analysis by fractional adsorption and sep. examn. of the material on each membrane. Nitrocellulose membranes on a cloth base are especially adapted for use in pressure filters for removing a small amt. of material from a large vol. of solvent. Roger W. Ryan

Adsorption. IX. The adsorption of gases by wood charcoal at low pressures. A. Magnus and L. Cahn. *Z. anorg allgem. Chem.* **155,** 205–19(1926); cf. *C. A.* **20,** 2104.—Henry's law, which formulates the proportionality between the quantity of gas adsorbed and the corresponding equil. gas pressure, was tested over the pressure range 0.001 to 653 mm with NH_3 and 0.001 to 1.0 mm. with CO_2. The adsorbent was about 20 g. of ordinary wood charcoal (sp. gr. 1.63). The temps. were 0, 25, 50, 100, 150, 300, 310 and 320°. The usual const. vol.-variable pressure adsorption method was used. The adsorption isotherms (micromols. of gas plotted against equil. pressure in mm. of Hg) all showed a parabolic curvature. No proportionality between pressure and amt. of gas adsorbed is shown, even at the very low pressures and 300°, conditions under which the gases might be assumed to behave as "ideal" gases. The higher the temp. (300–900°) at which the charcoal was "outgassed," the stronger its adsorption forces, and the greater the deviation from proportionality between adsorbed gas quantity and equil. pressure. Charcoal that had been outgassed at 300°, however, showed an adsorption of CO_2 that conformed closely to Henry's law. **X. Wood charcoal as an adsorbent for gases.** A. Magnus. *Ibid* 220–4.—The deviations from Henry's law in the results of measurements of gas adsorption on charcoal are more probably connected with the character of the charcoal surface than with the nature of the adsorbed gas. It is shown mathematically that a considerable increase in adsorptive ability of charcoal through cleaning of the surface by "outgassing" can be expected if the holes formed in the surface have dimensions of the same magnitude as the mol.

diam. of the adsorbed gas. The formation of such very small holes can only be caused by chem. decompn. of the charcoal surface. Strong heating of the surface during outgassing can bring this about, while a gently heated surface is freed only of its adsorbed gases or vapors. M.'s earlier adsorption measurements qualitatively support this theory. R. L. DODGE

Studies in adsorption and swelling. V. KUBELKA AND IVAN TAUSSIG. *Kolloidchem. Beihefte* **22,** 150–90(1926).—The adsorption by hide powder of formic, acetic, propionic, butyric, and the three chloroacetic acids was studied. The adsorption of the first 4 aliphatic acids as a function of concn. is given by $x/m = \beta c^{1/p}$. $CHCl_2CO_2H$ and CCl_3CO_2H showed irregularities. The swelling of hide powder in the above-named acids was detd., by a modified method of Reed. Swelling as a function of concn. is expressed by a parabolic isotherm of exponential form. The results are in accord with those obtained in the swelling of gelatin. The adsorption isotherms were corrected for each concn. to eliminate the swelling. Then it was found that these corrected isotherms of $CHCl_2CO_2H$ and CCl_3CO_2H followed the normal adsorption equations. MERRILL FENSKE

The application of the cinematograph to the study of laws governing the fall of particles in still water. W. GOOSKOV. *Fuel in Science & Practice* **5,** 340–4(1926).—G. shows by cinematographic and photographic records that the 2 phases of motion of particles falling in a still liquid (Rittinger's phases of (1) acceleration and (2) uniform motion), are not sharply differentiated. In (1) the fall of particles is independent of size but varies with d. differences; in (2) the effect of size is more pronounced. Eight diagrams are included. D A. REYNOLDS

Colloidal state a universal property of matter. P. P. VON VEIMARN. *Rev. gén. colloides* **4,** 129–37(1926), cf. *C. A.* **20,** 2607.—A reply to Duclaux's criticism of V.'s use of the term "colloidal state" (cf. *C. A.* **19,** 761). R. W. RYAN

Emulsions. A. CHWALA. *Giorn. chim. ind. applicata* **7,** 521-2(1925).—Review. ROBERT S. POSMONTIER

Investigations on emulsions. WM. CLAYTON. *J. Soc. Chem. Ind.* **45,** 288T (1926) —A plea for the standardization of methods and procedure in manufg. emulsions is made. Academic experimenters and industrialists would obtain more consistent and quant results by using emulsifying machines under fixed conditions. J. W. S.

Concentration and purification of solutions of hydrophyllic colloids. H. BECHHOLD AND E. HEYMANN. *Biochem. Z.* **171,** 33–9(1926).—Contrary to the statement of Reitstötter and Lasch it is not difficult to conc. gelatin and other hydrophyllic colloids by use of an ultrafilter. From gelatin and glue, the fractions are not identical with those obtained by the method of Bogue. By washing glue on an ultrafilter, both decompn. products and ash may be removed. W. D. L.

Liesegang rings. D. NAMASIVAYAM. *J. Proc. Asiatic Soc. Bengal* **20,** 367–9 (1924).—Expts. on formation of rings in capillary tubes are described in which NH_4OH diffused into a copper-agar agar sol gave alternate bands, pale green and dark blue in color. In every case the central band in the tube was pale green. An explanation of ring formation on the basis of the movements of electrically charged colloidal particles is advanced. J. W. SHIPLEY

The peptization of pyroxylin. M. L. BYRON. *J. Phys. Chem.* **30,** 1116–24(1926).—Soly. expts. are made with com. collodion cotton, EtOH (99.8%) and Et_2O. By using additional data from the literature on pyroxylin the following conclusions are drawn: (1) pyroxylin is not peptized by anhyd. Et_2O at any temp. (2) It is peptized by EtOH at low temps. (3) The peptization is due to adsorption of polymerized EtOH. (4) The alc. is polymerized in Et_2O-EtOH mixts. by the Et_2O. The history of pyroxylin is briefly described. JOHN T. STERN

H. Abronn's evidence for the micellar theory to the year 1916. C. STEINBRINCK. *Kolloidchem. Beihefte* **33,** 6–20(1926). E. J. C.

Polychrome mercury hydrosols. A. GUTBIER. *Kolloid-Z.* **38,** 82(1926).—Polemical against Feick (*C. A.* **20,** 1932). B. C. A.

Some experiences with production of colloidal lead. WILHELM STENSTROM AND MELVIN REINHARD. *J. Biol. Chem.* **69,** 607–12(1926).—Conditions for the prepn. of a stable Pb sol are described. Arcking in a dil. KCl soln. gave the best results. ARTHUR GROLLMAN

The anomalous flocculation of clay. W. O. KERMACK AND W. T. H. WILLIAMSON. *Nature* **117,** 824(1926).—The recent letter of Joseph and Oakley (*C. A.* **20,** 2439) is discussed. It is pointed out that the presence of silica on the surface of the clay particles is essential for the anomalous flocculation. On addn. of colloidal silica to alk. kaolin suspensions, these showed marked anomaly, nothing at all without silica. A similar

enhanced effect (after a delay of 24 hours or more) was observed for Cs, K and NH_4 salts ($p_H > 7$). B. J. C. VAN DER HOEVEN

Antagonism of ions as a problem in chemistry. A. BELÁK AND E. SZÉP. *Biochem. Z.* **171**, 22-32(1926).—The seat of the antagonism of ions is not upon colloid surfaces, but upon dissolved ions. This is shown by the influence of various ions upon the ionization of Ca salts, those ions (Na and K) which repress the ionization being antagonistic to Ca. Mg ions and nonelectrolytes do not affect the ionization of Ca salts. W. D. L.

Antagonistic action of ions in the coagulation of colloids. K C SEN. *Chem. News* **133**, 131-2(1926); cf. *C. A.* **20**, 857.—Discussion of results of S. and Weiser. JOHN T. STERN

The influence of some lyophilic colloids on the velocity of chemical reactions. E. SAUER AND W. DIEM. *Z. angew. Chem* **39**, 955–61(1926).—The influence of gelatin and gum arabic addns. on the basic Et acetate and the acid Me acetate hydrolysis was studied. The velocity const k at 30.02°, $c_{NaOH} = 0.05$, $c_{ester} = 0.04$, for Et acetate sapon is (by titration) 8.25. On addn. of 1, 2, 4, 6, 8 and 10% gelatin k decreased to 8.13, 7.07, 4.99, 3.33, 2.42 and 1.44, resp. The gelatin was electrosmotically purified, ash content 0.088%, moisture 13.6%; percentages are calcd on air dry material. For each gelatin expt. the consts as calcd. show a tendency to decrease with time. This is considered to be due to decompn. of the gelatin by alkali (NH_3 was liberated), the consts. given are extrapolated. The decrease of const $k_0 - k$ as a function of the gelatin concn. c follows from $k_0 - k = 0.94\ c^{0.873}$. It could be shown that viscosity is not the factor inhibiting the speed, but that the amphoteric character of the gelatin enables it to bind increasing amts. of NaOH and thus causes the active NaOH concn to decrease. A const. difference between the titrated (corrected for gelatin decompn) and the calcd. (from velocity const. in gelatin-free soln) amt of NaOH was found in each expt, representing the bound alkali. From these figures the equiv wt of gelatin was calcd. to be 7683. In the presence of gum arabic k decreases in a similar way: for 1.0, 2.5, 5.0, 7.5, 10.0 and 15.0%, k dropped to 7.79, 6.75, 4.02, 3.06, 1.77 and 1.13, resp. For each gum concn., k again drops with time, here due to decompn of the gum arabic (Ca-Mg arabinate) to sodium arabinate ($CaCO_3$ turbidity was observed). Expts. with pure Na-arabinate addns. did not show a time drop of k, and a diminished drop of k with increasing arabinate concn.; the latter drop is unexplained. Direct viscosity influence is shown to be improbable. Me acetate sapond. with varying amts. of HCl had a reaction const. directly proportional to c_{HCl}. Addn. of gum arabic to the Me-acetate–HCl mixts. caused a decrease in k (from $10^5 \cdot k = 68.36$ down to 36.91 for 0 and 4.26% gum arabic, $c_{HCl} = 0.06433$, temp 30.00°), explainable by the p_H rise due to liberated arabinic acid. The addn of arabinic acid influenced k very little ($10^5 \cdot k$ = 68.36 and 68.80 for 0 and 4.404% arabinic acid, $c_{HCl} = 0.06433$, 2% Me acetate). If no HCl is added arabinic acid influences the hydrolysis considerably, as is to be expected ($10^5 \cdot k = 1.74$, 2.556 and 4.153, resp., for 1.321, 2.202 and 4.404% dry arabinic acid, $c_{HCl} = 0$, $t = 30.00°$); from these detns the dissocn const. of arabinic acid has been calcd (W. Diem, *Dissertation*, Stuttgart) The results obtained are not in agreement with the adsorption theory of Pearce and O'Leary for the influence of gum arabic (*C. A.* **18**, 1935). B. J. C. VAN DER HOEVEN

The value of Traube's rule in the coagulation of hydrophobic sols. H FREUNDLICH AND VERA BIRSTEIN. *Kolloidchem. Beihefte* **22**, 95-101(1926).—The coagulation of As_2S_3 sols by a series of amine salts of increasing number of alkyl groups ($C_2H_5NH_2$ HCl, $(C_2H_5)_2NH.HCl$, etc.), was studied, and also the coagulation of iron oxide sols by Na salts of acetic to capronic acids. Both cases showed the coagulation value to be very regular with increase in CH_2 group. The difficultly sol. Na fumarate had a smaller coagulation value than the more sol Na malonate. MERRILL FENSKE

Influence of gelatin on the decomposition of boiling aqueous solutions of hydrogen peroxide. V. KUBELKA AND J. WAGNER. *Kolloidchem. Beihefte* **22**, 102–42(1926).—Substances which lower the surface tension do not change the titer of H_2O_2, while those which raise the surface tension do change the titer. H_2O_2 as a weak acid reduces the surface tension of gelatin soln. (positive adsorption) while Na_2O_2 as a salt either is without action or slightly raises the surface tension (negative or no adsorption). Alk. solns. with gelatin show always at the beginning of the heating a violent frothing, which quickly decreases. Neutral or acid solns. do not froth. In alk. solns. gelatin is hydrolyzed, several mol. dispersed products being formed. H_2O_2 assists this reaction. The course of the time curves indicated that in weak alkali, after a given time, most of the H_2O_2 is decomposed (faster than in acid or neutral solns.), yet a certain amt. of the H_2O_2 is firmly held in the soln. and is not expelled by further boiling. In the evapn.

of H_2O_2 solns. with gelatin in acid or neutral soln , small amts. of a peroxide product are formed; by evapn. of the same mixt. in alk. soln , the H_2O_2 or the O_2 in nascent state oxidizes the decompn. product of gelatin, forming HNO_3. MERRILL FENSKE

The precipitation of aluminum as hydroxide by means of ammonia. GERHART JANDER AND OTTO RUPERTI. *Z. anorg allgem. Chem* **153**, 253-9(1926) —To obtain the best results in the *estn. of Al* by pptn as $Al(OH)_3$ with NH_4OH the reaction mixt. should contain no excess of free NH_4OH, very little NH_4 salts, and should be filtered cold through a membrane filter. *The soly of $Al(OH)_3$ in H_2O* (soln. prepd by the action of Al amalgam on pure H_2O) was 0.6 and 3 2 mg /l in cold and hot solns , resp. NH_4OH increases the soly. of $Al(OH)_3$ enormously and its salts exert a much smaller influence in the same direction R. E. GIBSON

The crystallization of sucrose solutions. H. I. WATERMAN AND A. J. GENTIL. *Chem. Weekblad* **23**, 345-8(1926).—The time necessary for the appearance of the first crystal and for complete crystn of supersatd sucrose solns was detd at 40°, 60°, 70° and 90° as an extension of previous work by van Ginneken and Smit at 80° (*C. A.* **14**, 230). Supersatd solns of com. white sugar were prepd at 110° or 130°, sealed in glass tubes and rapidly transferred to a water thermostat of the desired temp. The time required for first visible appearance of a crystal (av of several detns. with reasonable agreement) was, *e g*, at 40°, 78% soln , 1000 min ; 80% soln , 270 min ; 82% soln , 115 min.; 84% soln , 95 min The period between first appearance and complete crystn. (opaque tube), if necessary induced by seeding, was around 200 min. at 40°. This period at first decreases with increasing sugar percentage, then increases again due to increased viscosity. It appeared that inoculation with a small crystal (0 5 to 2 mg) causes a slower crystn. than with a large crystal (150 to 200 mg), if, however, the same wt of small crystals is used the larger surface seems to promote the crystn. velocity. In several expts it was found that large crystal seeding caused the formation of fine grain, while small crystal seeding gave a coarser grain Tabulated data and graphs (English notation) are given B. J C VAN DER HOEVEN

The solubility of lead iodide in solutions of sodium chloride at 25°. L. J. BURRAGE *J. Chem Soc* **1926**, 1896 —Solid PbI_2 was shaken in salt solns of concns varying from 0 29 g per 100 g. of soln to 29 8 g per 100 g of soln , while the PbI_2 dissolved by the salt soln varied from 0 778 to 1.79 g per 100 g. of soln. Further increase in NaCl concn caused a new solid phase contg. Cl to form. Reference is made to the complex salt PbI Cl MERRILL FENSKE

The temperature of maximum density of alcohol-water mixtures. J. P. McHUTCHISON *J. Chem Soc* **1926**, 1898 9 —Temps of max. d have been detd for Me, Et, *n*-Pr, *iso* Pr and *n*-Bu alc -H_2O mixts Despretz's law of the lowering of the temp. of max. d of H_2O, by the addn of a sol salt, as being directly proportional to the concn. of solute, is not obeyed by feebly ionized or non ionizable substances M. F.

The expression of the reaction of aqueous solutions. I M. KOLTHOFF. *Biochem. Z.* **169**, 490–3(1926) -- The method devised by Sorensen for expression of the reaction of solns. should be retained in preference to the other methods so far suggested. W. D L

A new diffusion equation. DONOVAN WERNER *Svensk Kem Tid* **38**, 135 7 (1926).—This is a purely mathematical paper ending with the statement ". . therefore the results attained indicate that in crystn the rate is not regulated by the diffusion but by a process regulated purely by the surface." A R ROSE

Two contributions to the theory of concentrated solutions. W. HEITLER *Ann. Physik* **80**, 629–71(1926) —A mathematical study of the nature of solvation, and the behavior of binary mixts. In solns. showing solvation, the space surrounding solute mols. may be occupied only by solvent mols. to the practical exclusion of those of the same species; the solute thus acts on the solvent only indirectly. Liquid mixts. are treated as a simple cubic space lattice, in which the most probable arrangement of mols. around a mol. of a given species is calcd. By assuming that heat of mixing is independent of temp., and that the partial molal heats of mixing are identical, an equation of state for the mixt. is obtained, by which the properties of the mixt. may be calcd. from the heat of mixing. H compares this with the literature on partial pressures and heats of mixing, and calcs. the velocity of sound in mixts. B. H. CARROLL

Theory of concentrated solutions. III. Physical constants of mixtures of *m*-nitrotoluene and *m*-toluidine with some hydrocarbons. A. DESSART *Bull soc. chim. Belg.* **35**, 9–28(1926).—In continuation of previous work (*C A.* **16**, 3021; **20**, 1548), systems of *m*-$MeC_6H_4NO_2$ (I) and *m*-$MeC_6H_4NH_2$ (II) with cyclohexane, methylcyclohexane, C_6H_5Me and C_6H_6 have been studied in detail from the standpoint of their deviation from ideality or in particular their deviation from Mortimer's relation (*C. A.*

17, 2216). With the 2 aromatic hydrocarbons I and II give values of f (Mortimer's relation) of 1.13 and 1.41, resp., the relation holding closely. With the 2 satd. hydrocarbons, values of f were approx. 1.84 and 2.12, the relation not holding well near the crit soln. temp. The magnitude of the coeff. f is a good indication of the degree of departure of a soln. from ideality, but the parallelism is not complete. The prepn. and properties of pure I and II are described in detail. W. B. PLUMMER

The dissociation of water in potassium and sodium bromide solutions. H. S. HARNED AND G M JAMES. *J. Phys. Chem.* **30,** 1060–72(1926).—Measurements of the following types of cells are made: H_2 | KOH(m_1), KBr(m) | K_xHg | KOH(m_0) | H_2; H_2 | KOH(m_0), KI(m) | K_xHg | KOH(m_0) | H_2; H_2 | KBr(m_0), KBr(m) | AgBr | Ag; H_2 | HBr(m_0), NaBr(m) | AgBr | Ag, according to the methods of previous investigators (cf. *C. A.* **20,** 859) and by use of addnl. data of similar investigations, the activity coeff. of KOH in solns. of KBr and KI and of HBr in solns. of KBr and NaBr are calcd. From this a calcn of the activity coeff. of H_2O as an electrolyte and its ionic concn. is made. The results are given in tables and curves. JOHN T. STERN

Ionization of strong electrolytes. H. M. DAWSON AND J. S. CARTER. *Proc. Leeds Phil. Lit. Soc.* **1,** 14 6(1926).—Measurements are made over a wide concn. range for the combining capacity of I_2 with NaCl to give the perhalide $NaClI_2$. The equil. is detd. at 25° by a soly. method. The relation $S = S_0l^{-\alpha C}$ is found to express the soly of a nonelectrolyte in an electrolyte of concn C, when chem. interaction between nonelectrolytes and electrolytes is excluded. α is a const. to measure the salting-out effect of salt, and is evaluated from the measured soly of I_2 in salt soln. and K_0, the dissocn const. of the perhalide extrapolated to zero concn. The results show that the combining capacity of NaCl for I_2 is the same whether the salt is present in dil. or concd. soln. contrary to the Arrhenius theory. H. R. MOORE

The thermodynamic properties of electrolytes in acetic acid and in liquid ammonia. T. J. WEBB. *J. Am Chem. Soc.* **48,** 2263–71(1926).—The f. p. depressions of anhyd. AcOH and liquid NH_3 contg. electrolytes were measured and the results compared with the equations of Debye and Huckel. In dil. solns. where the concn was great enough for the exptl. errors to be negligible the phys. properties of the solvent and the radii of the ions were found to account for the results. In more concd. solns. an increase in the dielec const of the solvent was indicated. R. E. GIBSON

Aqueous solutions of sodium silicates. III. Sodium ion activity. R. W. HARMAN. *J. Phys. Chem.* **30,** 917–24(1926); cf *C. A.* **20,** 2931.—Measurements of Na-ion activity by means of a Na-Hg electrode have been made for ratios 1:1, 1:2, 1:3 and 1:4, concns. ranging from 1.0 to 0.01 N. The activity coeff. γ has been plotted against the wt normality, N_w, and against the ratio Na_2 SiO_2. The curve of γ against N_w for ratio 1:1 passes through a min. at a concn lying between 0.1 and 0.2 N_w. The other curves show no min. In very dil. solns γ is high, but not so high as in corresponding concns. of NaOH, whereas in concd. solns of higher ratios γ is abnormally low. PER K. FROLICH

Electrolytic dissociation of dibasic acids. III. Determination of second dissociation constants from solubility experiments. ERIK LARSSON. *Z. anorg. allgem. Chem.* **155,** 217–54(1926); cf. *C. A.* **19,** 923.—The soly. of a weak acid in the dil. soln. of a neutral foreign salt is generally greater than in H_2O because of partial salt formation with the weak acid. The dissocn. const. of the (strong) acid which is a part of the salt can thus be calcd from the soly. of the other (weak) acid in the neutral salt soln. and its dissocn. const. This method was employed by Datta and Dhar (cf. *C. A.* **9,** 2476) but inadequately. The formula is derived anew and solubilities of the poorly sol. weak acids: benzoic, cinnamic and hippuric in the Na salt solns. of the following acids are detd and their second dissocn consts. calcd.: *succinic acid* (by benzoic) —log.K_2 = 5.6, *fumaric acid* (by cinnamic, benzoic and hippuric) —log.K_2 = 4.50, *l-malic acid* (by benzoic) —log.K_2 = 5.14, *d-tartaric acid* (by benzoic and hippuric) —log.K_2 = 4.29. The soly. equilibria are reached from below in 24 hrs., the time for reaching them from the concd. side being inconveniently long. The optimal soly. of the weak acid for various cases is discussed. The agreement with electrometric detns. is satisfactory. The method may also be used for bases. JOHN T. STERN

The thermal decomposition of nitrous and nitric oxides. E. BRINER, CH. MEINER AND A. ROTHEN. *J. chim. phys.* **23,** 609–20(1926).—Under the influence of temps. from 700° to 1350° dried N_2O decomposes in 2 ways simultaneously. $N_2O \longrightarrow N_2 + {}^1/_2O$, $N_2O \longrightarrow NO + {}^1/_2N_2$. At 1300° and a flow of 15 l. per hr. the yield of NO is 23% of the vol. of N_2O decompd. In the presence of the catalysts SiO_2, Pt and platinum black, the amts of NO are greatly reduced. N_2O is not formed during the thermal decompn. of NO. Because of the difficulty in prepg. N_2O from the elements, the re-

action studied will not be of value in the problem of N fixation. A diagram and description of app. are given. E. R. Schierz

•• **The unimolecularity of the inversion process.** George Scatchard. *J. Am. Chem. Soc.* **48**, 2259–63(1926).—A mathematical analysis of the results of Pennycuick on the rate of inversion of sucrose in presence of HCl (*C. A.* **20**, 859). An equation, giving the alleged change in the rate of reaction as a function of the time, has been derived and from its nature S. concludes that the change is due to slightly inefficient mixing. It is concluded that in homogeneous solns. the rates of inversion are const. within a few parts per 1000 and the probable values of these rates are given. R. E. G.

The effect of moisture and paraffin surface on the rate of reaction of nitric oxide and oxygen. R. L. Hasche. *J. Am. Chem. Soc.* **48**, 2253–9(1926); cf. *C. A.* **19**, 1980.—The effects of a paraffin-coated reaction chamber and of moisture, SO_2 and N_2O_4 on the speed of reaction of NO and O at 25° were detd. Easily reproducible results were obtained with the app. previously described. An induction period of 10 sec. appeared in all expts. made at low pressures (below 14 mm. of Hg) and in the absence of H_2O vapor. This induction period is a function of the initial pressures and is influenced by the H_2O content of the system. The results do not permit decision as to whether the induction period (1) represents the time necessary to destroy an inhibitor of the reaction or (2) is due to a primary process taking place. A mechanism for the role of H_2O in this reaction might be $NO + H_2O = NO.H_2O$; $NO.H_2O + NO = (NO)_2.H_2O$; $(NO)_2.H_2O + O_2 \rightleftharpoons 2NO_2 + H_2O$. There is evidence that there is a chem. catalysis produced by moisture SO_2 and N_2O_4 have practically no effect on the speed of the reaction R. L. Dodge

Oxidation of oxalic acid by iodic acid in water solution. S Toda. *Biochem. Z.* **171**, 231–9(1926).—In order to det. the nature of the reaction by which HCN stops certain oxidation processes, the effect of HCN upon the reaction $2HIO_3 + 5H_2C_2O_4 = 6H_2O + 10CO_2 + I_2$ is studied. This reaction is stopped by HCN, although the HCN probably does not react with either HIO_3 or $H_2C_2O_4$. If the HCN is aerated out of the soln., the oxidation proceeds again at its normal rate so that the action of the HCN is reversible. Traces of Fe and Co catalyze the reaction positively. If the HIO_3 and $H_2C_2O_4$ are highly pure, the reaction is slow. Therefore, the normal oxidation is catalyzed by traces of Fe in the reagents, and 90% of the effect of HCN is due to its reaction with this Fe. By use of this reaction, 10^{-5} mg. Fe in 4 cc. may be detected. It is probable that HIO_3 and $H_2C_2O_4$ which are free from metals will not react. W. D. L.

Solutions of the electronegative elements in liquid ammonia. I. The action of selenium, tellurium, arsenic and a solution of sulfur in liquid ammonia upon cyanide. F. W. Bergstrom *J. Am. Chem. Soc.* **48**, 2319–27(1926) — Bergstrom confirmed the reaction equil. for S dissolved in liquid NH_3 as $10\ S + 4\ NH_3 \rightleftharpoons 6\ H_2S + N_4S_4$, a reaction proposed by Ruff and Geisel. This was done by studying the action of metallic cyanide solns. upon a soln. of S in liquid NH_3. Bergstrom found that several other reactions and equil. exist besides the above when S dissolves in liquid NH_3. Se has an extremely slight soly. and both S and Se behave as weak nitridizing (de-electronizing) agents in liquid NH_3. Solns. of cyanides in liquid NH_3 react readily with S and Se, slowly with Te and not at all with As. The following new compds. were prepd.: $Al(SCN)_3.5NH_3$, $Mg(SCN)_2.4NH_3$, $Mg(SeCN)_2.4$ (and 6?)NH_3, $Zn(SeCN)_2.4NH_3$, $Al(SeCN)_3.5NH_3$. J. W. Shipley

Reactions between gases at high pressures. H. W. Strong. *Chem. Eng. & Mining Rev.* **18**, 454–9(1926).—A lecture. E. J. C.

The maximum yield of chemical reactions in gaseous systems. Th. de Donder and G. Van Lerberghe. *Bull. sci. acad. roy. Belg.* [5] **12**, 152–62(1926).—A mathematical discussion. W. B. Plummer

Some consideration of the reaction constant equation, and a simple method of determining the end point. S. E. Sheppard. *Phil. Mag.* [7] **2**, 448(1926).—Priority claim with reference to method of Smith (*C. A.* **20**, 1548). S. C. L.

The elasticity coefficients and the thermodynamic integration factor for the solid state. A. Press. *Phil. Mag.* [7] **2**, 431–6(1926). S. C. L.

Reactions in the solid state. VI. D. Balareff. *Z. anorg. allgem. Chem.* **153**, 184–90(1926); cf. *C. A.* **19**, 2591.—After a crit. study B. concludes that the alleged rapid reactions between powders, described by Westerhold, Garre, Kordes and Kalsing, are in all probability not reactions between cryst. phases at all In every case conditions of temp., humidity, etc., are such as to favor the formation of liquid or gaseous phases to which the reactivity is ascribed. R. E. Gibson

Chemical reactions taking place in mixtures of solid substances at high temperatures.

G. TAMMANN. *Z. angew. Chem.* **39**, 869–75(1926).—Many reactions between solid substances take place at temps far below the m. ps. of the components. As a rule these reactions are complete when the heat of reaction is higher than 1000 cal. per mol. In other cases an equil between the initial substances and the reaction products is possible. The reaction $BaSO_4 + Na_2CO_3 = BaCO_3 + Na_2SO_4$ does not take place to any noticeable extent below 850°. A reaction is sometimes reversed in the presence of water. Thus the process $PbS + CdO \longrightarrow PbO + CdS + 4.2$ cal. takes place in the dry state, while in the presence of water PbS is formed, which is much less sol in water than CdS The most convenient method for detg. the temp. of the beginning of a reaction between dry powders is by observing the time-temp. diagram of the mixt. When another time-temp. diagram (starting at the same initial temp.) is taken after the reaction has come to an end, a part of the first curve runs above the second curve, indicating the beginning and the end of the reaction When powdered cryst. substances are formed into tablets and 2 different tablets are pressed together the thickening of the reaction layer follows the equation $l = b \log t +$ const., where l is the thickness, t the temp. and b a function of the temp. The validity of this equation was examd. on the system WO_3-CuO The temp of the beginning of the reaction coincides with the temp. at which the atoms of the crystal lattice not only vibrate about their lattice points but commence to change places owing to the increased amplitude of vibration. At the same time an orientation of the crystals takes place causing a sintering of the mass. This temp is as a rule 0 57 of the abs temp of the melting point. In case one of the 2 components exists in 2 cryst. modifications the temps. of transformation, sintering and reaction coincide. The "inner diffusion," as represented by the number of changes of place per mol. and sec, is very probably an *e* function of the temp. Stirring of the powder accelerates the reaction The degree of the reaction depends upon the size of the grain and increases when the diam. of the grain is smaller than the thickness of the layer of the reaction product. The presence of small quantities of water can be detected by measuring the elec. cond. As little as 0 001% of water can be detected. In the reactions between the acid and basic anhydrides PbO, CaO and ZnO are the most active, while MgO, CuO, NiO, CeO_2, FeO and BeO are approx. half as active Fe_2O_3 and Al_2O_3 do not react. Conclusion: It is unnecessary to fuse or melt the substances in order to affect a reaction, the temp of reaction lying very often far below that of fusion. This principle is capable of application in several branches of inorg chemistry. EMIL KLARMANN

Equilibria in systems with phases separated by a semipermeable membrane. XVII. F A. H. SCHREINEMAKERS *Verslag Akad. Wetenschappen Amsterdam* **35**, 541–51(1926); cf *C. A.* **20**, 2935.—Continuation of previous papers; ternary equilibria with vapor phases are considered B. J. C. VAN DER HOEVEN

Catalysis and autoxidation. Antioxygenic and pro-oxygenic activity. CHARLES MOUREU AND CHARLES DUFRAISSE. *Chem. Reviews* **3**, 113 62(1926) —Numerous instances of autoxidation, or spontaneous oxidation by free O, are cited, including oxidation of P, S compds, $CHCl_3$, Na_2SO_3, paraffin, rubber, silk, living tissues, etc These oxidations can be retarded or accelerated by the presence of small amts of substances acting as catalysts This type of catalytic activity falls in 2 classes, called antioxygenic activity (negative catalysis), that which inhibits the action of O, and pro-oxygenic activity (positive catalysis), that which accelerates the action of O. A general review of the work of M and his collaborators in this field is presented. Catalysts exerting anti-oxygenic activity all have the property of being oxidizable substances Among such are phenols, inorg and org. compds. of I, S, N, etc. The activity of an anti-oxygen is localized in the oxidizable part of the mol. The catalytic activity of an anti-oxygen increases with increase of oxidizability. A theory of the mechanism of anti-oxygenic activity is proposed The theory supposes that auto-oxidation starts with the union of an O mol., O_2, with a mol. of the auto-oxidizable substance, A, giving rise to the peroxide $A[O_2]$. This peroxide or first term of the successive transformations which an auto-oxidizable substance takes with O, is formed with an absorption of energy. The peroxide results from the union of active mols of A and O. Anti-oxygens act in catalyzing the inverse reaction of the formation of the peroxide $A[O_2]$, that is, its destruction. The A and O_2 are taken from the state of activated mols at the moment of their combination, and returned to the mixt in an inactivated state by the action of the anti-oxygen catalyst. R. L. DODGE

The catalytic activity of dust particles. F. O. RICE. *J. Am. Chem. Soc.* **48**, 2099–2113(1926) —All chem reactions proceeding under the usual conditions do so in the presence of great nos of dust particles; these are the cause of a no. of anomalous results in certain supposedly homogeneous reactions. *The thermal decompn. of H_2O_2* occurs mainly on dust particles but partly on the surface of the vessel; there is no evidence of

any homogeneous decompn. *The thermal oxidation of Na_2SO_3* is almost entirely a dust reaction, for when the dust is removed the rate of oxidation is immeasurably slow. *The photochem. decompn. of H_2O_2* occurs largely on the surface of suspended dust; when this is removed, the quantum yield is very greatly diminished. A theory of *negative catalysis* is proposed. Further publications on this subject giving details of experimentation are promised. R. L. Dodge

Catalytic decomposition of nitric oxide at the surface of platinum. T. E. Green and C N Hinshelwood. *J. Chem. Soc.* **1926,** 1709 13.—The rate of the reaction $NO = N_2 + O_2$ at the surface of a heated Pt wire was measured over a wide temp. range. This reaction is unimol. with respect to NO, uninfluenced by N_2 and retarded by O_2. The reaction is bimol. in the gas phase and unimol. at the surface of the catalyst. Merrill Fenske

Catalytic decomposition of solutions of sodium hypochlorite by finely divided metallic oxides. Eugen Chirnoaga. *J. Chem. Soc* **1926,** 1693-1703.—A study was made of the velocity of decompn. of aq. solns of NaClO in the presence of Co peroxide, Ni peroxide and mixts of these peroxides with one another and with Al_2O_3 The vol. of evolved O over any time was measured, and applied in the general velocity equation $-dc/dt = k_1C^{1/n}$, the const. *n* in some cases being nearly unity. Free alkali reduces the reaction velocity with both Ni and Co peroxides Al_2O_3 gel is without measurable activity, but with Co peroxide it shows a "promoter" action which is a max at about 26 to 39% alumina. Al_2O_3 with Ni peroxide shows at first a very marked promoter action, followed later by an equally marked "depressor" action; this is probably due to the enveloping of the Ni peroxide by the Al_2O_3 gel. Mixts of Co and Ni peroxides are more active, wt for wt, than either singly, the max effect being about 30% Ni peroxide In order of decreasing catalytic activity the oxide gels investigated may be arranged thus: Ni > Co > Cu > Fe > Mn > Hg. Merrill Fenske

Low-temperature oxidation at charcoal surfaces. II. The behavior of charcoal in the presence of promoters. E. K. Rideal and W. M. Wright *J. Chem. Soc.* **1926,** 1813-21; cf. *C. A.* **19,** 2583.—A detailed study was made of the effect of N_2 and Fe on the catalytic behavior of charcoal in the oxidation of oxalic acid These promoters result in an extension of the total surface and also a possible small extension in the fraction of the catalytically active surface. Two new types of catalytically active surface are presented, an Fe C-N complex surface with a sp activity about 800 times that of the original active C surface, and an Fe-C surface with a sp activity about 50 times that of the original surface Merrill Fenske

Catalysis in buffer solutions. I. Martin Kilpatrick, Jr. *J. Am. Chem. Soc* **48,** 2091-9(1926). -The catalytic decompn. of nitrosotriacetoneamine was studied in solns of NaOH and in alk buffer solns The rate of reaction was followed by measuring the vol of gas evolved The rates of reaction and temp coeffs. were detd. from 20° to 80°. The buffer solns used were 0.05*M* KH_2PO_4 and 0 0468*M* NaOH and 0.05*M* H_3BO_3 and 0 021*M* NaOH The temp coeffs of the reaction rates were unaffected by neutral salt. The results are in agreement with Bronsted's concept of secondary kinetic salt effect (cf. *C A.* **20,** 325). R. L. Dodge

The catalytic influence of ferric ions on the oxidation of ethanol by hydrogen peroxide. J. H Walton and C. J. Christensen. *J. Am. Chem. Soc.* **48,** 2083-91 (1926).—The speed of oxidation of EtOH and the catalytic decompn. of the H_2O_2 in the presence of fixed concns. of Fe salts were measured in solns. contg. various amts of HCl, HNO_3, H_2SO_4 and AcOH The rates were detd. by titration with permanganate solns. In all cases increase in acid concn. decreased the speed of the oxidation of EtOH to AcOH. The most favorable conditions for the rapid oxidation of the EtOH is to have just enough acid in soln. to keep the Fe salt from pptg. as a result of hydrolysis. The oxidation of the EtOH to AcOH was followed by further oxidation to CO_2 and H_2O. The efficiency of the oxidation is measured by the ratio of EtOH actually oxidized to that of the total decrease in H_2O_2 concn. It is concluded that ferric acid (H_2FeO_4) is the intermediate in the oxidation of EtOH by Fenton's soln (H_2O_2 soln. contg. Fe salts). Cu ions promoted the decompn of the H_2O_2 but did not accelerate the oxidation of EtOH. Na_3VO_4, K_2PtCl_6, $CoCl_2$, $NiCl_2$, Na_2MoO_4, $U(NO_3)_2$, $MnCl_2$, $Mn(OAc)_2$, H_2PtCl_6, Na_2WO_4, $CeCl_2$, $K_2Cr_2O_7$ and $NaBO_2$ all catalyzed the oxidation, but to a lesser degree than did Fe salts. R. L. Dodge

Catalytic action. XVII. Catalytic actions of various types of reduced copper upon alcohols. Tohoru Hara. *Mem. Coll. Sci. Kyoto Imp. Univ.* **9A,** 405-25(1926).—The products formed by passing some primary and sec. alcs. over reduced Cu prepd. in 3 different ways were sepd. and identified. The temps. employed were 230° and 330°. Cu I was prepd. by pptg. CuO from a hot soln. of $CuSO_4$ with an equiv. amt. of NaOH.

The ppt., washed free from SO_4, was dried at 100° and reduced in H at 220–230°. Cu II was prepd. in the same way but with an excess of NaOH. Cu III was obtained by ignition of $Cu(NO_3)_2$ and reduction with H at 220–230°. 10 g. of the oxide was used in expts. with Cu I and Cu II; 20 g with Cu III. The alc. vapors were passed over the catalyst at the rate of 5–10 g./hr The reaction products were sepd. by fractional distn. The alcs. used were EtOH, isoamyl alc , benzyl alc., isopropyl alc., methylisobutylcarbinol, diisobutylcarbinol, methylphenylcarbinol, diphenylcarbinol, cyclohexanol, *l*-menthol and *d*-borneol. The nature of the reaction products varied with the catalyst used and the temp and rate of alc passage. In general, Cu I promoted principally the decompn. into unsatd. hydrocarbons and H_2O. Cu II accelerated mainly the dehydrogenation of the alcs Cu III accelerated both the dehydrogenation and the dehydration of alcs., its effect being midway between those of Cu I and Cu II. The mechanism of the action is best explained by the assumption of an intermediate unstable compd. of the catalyst and the alc , which readily decomposes, yielding the carbonyl compd. or the unsatd. hydrocarbon or both. An analogy is drawn between this catalytic action of Cu and the catalytic oxidation of org compds. in living organisms. R. L. Dodge

Action of nitric acid on metals in presence of catalysts. C. C. Palit and N. R. Dhar. *J. Phys Chem* **30**, 1125–33(1926); cf. *C. A.* **18**, 2456.—HNO_3 of 26% gives a max. yield of $HgNO_2$ with Hg. The following nitrates catalyze the nitrite formation in this order of efficiency: Hg^{I}, Fe^{III}, Mn^{II}, Ni, U, Cr, Co, Cu. HNO_2 is always the first reaction product Various reducing agents retard the reaction with Cu or Hg, but HCO_2H accelerates the attack of Hg. Sunlight accelerates both reactions. Org. S compds. or alkaloids retard uniformly only in high concns. John T. Stern

Conductivity and catalytic action of hydrogen halides in normal butyl alcohol. Heinrich Goldschmidt and Erlng Mathiesen *Z. physik. Chem.* **121**, 153–8(1926); cf. *C. A.* **19**, 922 —The conds. of HCl, HBr and HI in pure BuOH (b p. 116–117°, d_{25} 0.8059, dried by Al amalgam, redistd. over tartaric acid) are related to each other as 1:1 4.1.57, while the catalytic action upon the formation of $C_6H_5CH_2CO_2C_4H_7$ is 1:1 09:1.11 The addn. of H_2O to the soln of HCl lowers first the cond. and then raises it. The anticatalytic effect of this addn is studied. The results are presented in exact tables. John T. Stern

Active nitrogen. I. Nature and heat of formation. E. B. J. Willey and E. K. Rideal. *J. Chem Soc.* **1926**, 1804–12.—Active N may be either atoms or metastable mols in an excited form. In support of the at. hypothesis Buchwald (*C A.* **16**, 182) has shown that the glow decay rate follows a bimol law, whereas the views of Saha and Sur (*C. A.* **19**, 9) and the expts. of Rayleigh (*C. A.* **17**, 1187) favor the metastable mol hypothesis The heat of formation of active N was detd by 2 different methods, a mean value of 42,500 cal per g. mol. being obtained. It was concluded that "active" N is the element in a metastable mol. form. Merrill Fenske

Thermal properties of ice and water vapor. J. E. Fjeldstad. *Geofys. Publ.* [3] **11**, 15 pp (1925); *Science Abstracts* **29A**, 335 —The sublimation-heat of ice at temps. below 0° appears to have remained unknown. F. finds it to be approx. const. H. G.

The experimental determination of the heat capacity and the specific heat of steam at high pressures. K. A. Mayr *Siemens Z.* **6**, 371–4(1926).—A discussion of methods of procedure. No new data are recorded. C. G. F.

The measurement of coefficients of expansion at low temperatures. Some thermodynamic applications of expansion data. R. M. Buffington and W. M. Latimer. *J. Am. Chem. Soc.* **48**, 2305 19(1926).—The coeffs. of linear expansion of Al, Cu, Ag, rock salt, quartz (parallel to the optic axis) and Pyrex glass were accurately detd. by an interference method, for temps. between 90° and 315°K. The coeffs. of expansion of the cryst. solids tend to zero at low temps. and change more rapidly with temp. than do the sp. heats. An equation is derived whereby the entropies of 6 monatomic solid metals are satisfactorily calcd. and a simple extension of this equation to binary compds. is successfully made R. E. Gibson

The order of removal of manganese, chromium, iron, cobalt and nickel from amalgams. A. S. Russell, D. C. Evans and S. W. Rowell. *J. Chem. Soc.* **1926**, 1872–81.—The order of removal of Zn, Cd, Tl, Sn, Pb, Cu and Bi from Hg by oxidizing agents is in accordance with their positions in the normal potential series, while the order of removal of Mn, Cr, Fe, Co and Ni is not. The order in Hg is Zn, Cd, Mn, Tl, Sn, Pb, Cu, Cr, Fe, Bi, Co, Hg and Ni. The abnormal behavior of these elements is ascribed to a type of passivity, an electronic theory of which is proposed. On this theory the active state of these metals is ascribed to the existence of 2 electrons in the 4-quantum orbit of the atom and the passive state to one electron in this orbit. M. F.

An alternating-current cell. E. S. Hedges. *J. Chem. Soc.* **1926**, 1892–3.—

Two Cu electrodes which have been subjected to at least 50% reduction in thickness by cold rolling are immersed in a soln. consisting of 25 cc. HNO_3 (d. 1.42), 10 cc. HCl (d. 1.16) and 70 cc. H_2O. The max. difference in e. m. f. is 0.14 v.; the frequency is about one cycle per min. MERRILL FENSKE

Electromotive forces and the solvent. A. E. BRODSKII. *Z. physik. Chem.* **121,** 1-38(1926).—E. m. f. measurements are made of the mercurous halide electrodes against each other with various concns. of the corresponding K halides in H_2O and EtOH and MeOH and their mixts. with H_2O. A technic is described in detail by which results reproducible to 0.0001 may be obtained with Cl and Br, 0.001 with I. All chains show exactly const. temp. coeffs., which vary little with the solvent. The e. m. fs. vary strongly with the solvents and in accordance with the thermodynamically derived formula $E-E' = RT/F \times \log L_1L_2'/L_2L_1'$ (L_1 and L_2 = solubilities of one halide, L_1' and L_2' the other; E and E' = e. m. fs. in the 2 different solvents). The e. m. fs. in concd. solns. are independent of the solvent, which also agrees well with the theory. The reaction energies calcd. from these data are for H_2O solns. in fair agreement with the known reaction heats. In H_2O and 0.1 N soln the e m. fs. are: chain Cl | Br 0.1318-0.000188 t; Br | I 0.1838-0 000192 t; Cl | I 0.3156-0.000380 t in 100% MeOH and concn. 0.025 N: Cl | Br 0.1053-0.000113 t; in 97 30% EtOH, concn. 0 005 N: 0.1043-0.000098 t. JOHN T. STERN

Periodic phenomena at the anodes of copper and silver. E. S. HEDGES. *J. Chem. Soc.* **1926,** 1533-46; cf. *C. A.* **19,** 1773; **20,** 149.—Periodic changes in current strength and p. d. are observed in the anodic dissolution of Cu in solns. of HCl, NH_4Cl, NaCl, $CuCl_2$, KCN and of Ag in solns. of KCN, H_2SO_4 and NH_4Cl. These changes are associated with simultaneous film formation over the anode. Thus for Cu in HCl, a very dark thin gray film sweeps over the metal with a sudden rise in p. d H. R. M.

Electrochemical studies on the system benzamide-bromine. WLADIMIR FINKELSTEIN. *Z. physik. Chem.* **121,** 46-64(1926); cf. *C. A.* **19,** 1983.—$C_6H_5CONH_2$ dissolves in Br and in the cold red crystals of an addn. compd sep. out. The compn. $C_6H_5CONH_2Br_2$ is confirmed by the present work. The curve of the sp. cond. shows a max. at 14.5% $C_6H_5CONH_2$, having a positive coeff. of temp. The molal cond. runs similarly and falls then to 0.003. At high concns calcd. as $C_6H_5CONH_2Br_2$ this curve pursues a normal course. The cond. increases with time towards a const value Cryoscopic detns. show a polymerization, $1/i$ being a max. 5 at 8% $C_6H_5CONH_2Br_2$. Measurements on the transference no. indicate the dissocn $[C_6H_5CONH_2Br_2]_7 \rightleftharpoons [C_6H_5CONH_2\text{-}(C_6H_5CONH_2Br_2)_6]^{++} + 2Br^-$, the no. for the cation being 0 054. These results are discussed with respect to their meaning for the ionic structure. JOHN T. STERN

The electrical conductivity of salts in single crystals and in crystalline aggregates. G. TAMMANN AND G. VESZI. *Z. anorg. allgem. Chem.* **150,** 355-80(1926).—The sp. elec. cond. (K) of single crystals and of highly compressed pellets of $NaNO_3$, NaCl, NaBr, KCl, KBr and KCl KBr mixed crystals were measured with a max. error of ±8%. The numerous results, given in tabular and graphical form, are discussed and compared with those of former investigators. The sp. cond. of the cryst. aggregates is always greater than that of the single crystals, Hevesey's explanation of the phenomenon being confirmed (*C. A.* **15,** 3797). Log K is a linear function of T/T_M where T is the abs. temp. of the expt. and T_M is the m. p. The influence of impurities which do not form mixed crystals is also discussed. R. E. GIBSON

The electric double layer on the surface of mercury. ALFONS BÜHL. *Ann. Physik* **80,** 137-80(1926).—The elec. double layer on Hg has been studied by atomization of the metal in different atms. Several types of atomizers of simple construction were used, the resulting elec. charges being measured by means of a cylinder condenser and an electrometer. The expts. show that pure Hg, free from dissolved gases, gives positive carriers only. The carriers consist of Hg as proved by spectrum analysis and by expts. in the cold. Also negative carriers result when the Hg is in contact with gas, the time of contact required being about 10^{-2} secs. In this respect all the gases investigated behave alike. Negative carriers are similarly produced when traces of less noble metals are present in the Hg. Conclusions: Pure Hg, free from gases, has a positive surface layer. A marked electron atm. does not exist. It must be assumed that the attractive forces are small in the outer layer of mols. corresponding to the slight internal pressure of the mol. forces in this layer. Furthermore, it is assumed that the mol. forces attract the electrons towards the interior. The thickness of the layer poor in electrons is about 100 to 200 $\times 10^{-8}$ cm. This is about equal to the radius of the sphere of action for Hg. Adsorbed gases assist the escape of electrons from the Hg mols., resulting even in neg. charges on the surface. The formation of electrons is facilitated when less noble metals are dissolved in the Hg, the effect of the former being dependent

upon their position in the e. m f. series. In this case negative charges also result.
PER K. FRÖLICH

The aluminum anode film dielectric. M. SUBRAMANIAM. *J. Indian Inst. Sci.* 9B, 11-21(1926).—The leakage resistance of a film formed on an Al anode is directly proportional to the formation voltage and, for a given formation voltage, inversely proportional to the applied voltage. This resistance is approx independent of the frequency. When a voltage above a certain crit value is applied, the film collapses with flashes of light and a crackling noise. The electrostatic capacity of the double film in Al borate increases slowly with time. Copious exptl data are given.
R E. GIBSON

Measurements with the quinhydrone electrode. W. ACKERMANN. *Collegium* 1926, 208 11.—A review.
I. D. C.

Atomic moments of ferromagnetics. E. C. STONER *Proc. Leeds Phil. Lit. Soc* 1, 55-64(1926) —The at magnetic moments of the ferromagnetic elements may be computed (1) from the satn. value of the intensity of magnetization at low temps., and (2) from the variation of the susceptibility with temp above the "Curie point." The results obtained by these 2 methods in many cases differ markedly from each other. Further, there seems to be little agreement between them and the results deduced for the ions of the ferromagnetic materials from measurements made on solns of their salts. S attempts to reconcile these conflicting results by an application of the quantum theory of at magnetization. He assumes that the crystal contains groups of atoms and that the magnetic properties are due to ions having the same magnetic moments as those given by measurements on paramagnetic solns and salts In this way he avoids the assumptions, sometimes made, that changes occur in the constitution of the substance Finally a brief discussion is given of the possible conditions under which ions may continue to manifest paramagnetic properties when united in solids.
W W. STIFLER

Structure of the atomic magnet. Its normal position with respect to the space lattice and the remanent magnetism. R. FORRER. *Compt rend.* 183, 121 3(1926).—As shown previously (cf *C A* 19, 3207) the at magnet of Ni is a doublet while that of Fe is a triplet In the absence of distorting forces these multiplets assume positions symmetrical with respect to the crystal lattice F calls this orientation the "normal position." For Ni (cubic) two positions are possible. (1) with the constituents of the doublet parallel to the quaternary axes and their resultant directed along a binary axis; (2) with the constituents parallel to binary axes and their resultant along a quaternary axis For iron (equally cubic) the triplet cannot take a single symmetrical position but the constituents are parallel to the quaternary axes and the resultant is directed along a ternary axis. On these assumptions the behavior of Fe and Ni in weak fields is explained The remanent magnetism is computed and the results are shown to be in agreement with the values given by Ewing, Gumlich and Yensen.
W. W. S.

Magnetic susceptibilities and dielectric constants in the new quantum mechanics. J. H. VAN VLECK *Nature* 118, 226-7(1926). - From the matrix dynamics of Born, Heisenberg, Jordan and Dirac it follows that the spatial quantization relative to the applied field has no direct effect upon the magnetic susceptibility (or the dielec. const.). The dielec const of a diatomic gas is computed by the new mechanics
W. W S.

Additive coloring of alkali halide crystals. Z. GYULAI *Z. Physik* 37, 889-94 (1926).- A detn of the absorption coeffs for KCl and NaCl showed that the position of the max agreed well with the values obtained from coloring by Rontgen rays. It also applied to the influence of light on the shape of the absorption curve.
M F.

Color of the tervalent titanium ion. JEAN PICCARD. *J. Am. Chem. Soc.* 48, 2295-7(1926) —The (hydrated) tervalent Ti ion is colorless, but it has a strong latent color, on account of which $TiCl_3$ is colored Thus the violet color of $TiCl_3$ soln. is a mol. property of $TiCl_3$, or of a complex like $[TiCl_5]$.
R H. LOMBARD

The relation between the chemical composition of various organic liquids and the optical permeability of paper impregnated with them. S S. BHATNAGAR, N. A. YAJNIK, MATA PRASAD AND BASHIR AHMED *Z physik Chem* 122, 88-100(1926); cf. *C. A.* 19, 3056 --The permeability to light rays of paper impregnated with various members of homologous series has been observed. Light permeability was found to parallel the b p and *n* of the liquid; it is also a function of the ability of the liquid to spread on the paper. Max. permeability is attained when *n* of the impregnated film approaches that of the pure liquid. Investigations on homologous series showed a const. additive value for each $-CH_2$ group, the permeability increasing with increasing mol. wt. Normal members of a series showed higher values than the corresponding iso-compds. Aromatic hydrocarbons do not follow the above laws.
C. H. G.

The specific heats of hydrogen cyanide—a reply. *Soc.* **1926,** 1559–62; cf. Ingold, *C. A.* **20,** 1349.

The heat of combustion of salicylic acid. P. E. VERKADE AND JAN COOPS. *J. Chem. Soc.* **1926,** 1437–43.—Careful redetn. of heat of combustion of salicylic acid from many sources, including a sample used by Berner (*C. A.* **20,** 1022), confirms V. and C.'s previous value 5241.7 cal.$_{15°}$ per g. (air) (v = const.; 19.5°). There must, therefore, have been some error in the heat capacity of B.'s calorimeter. F. R. B.

The heat of combustion of benzoic acid. W. JAEGER AND H. V. STEINWEHR. *Z. physik Chem.* **119,** 214–8(1926).—Reply to Verkade and Coops, *C. A.* **20,** 327. F. R. B.

The heats of fusion of ethyl ether, methyl alcohol and ethyl alcohol. SHINROKU MITSUKURI AND KENJI HARA. *Science Repts. Tôhoku Imperial Univ.* **15,** 205–8(1926).—The depression of the f. ps. of Et_2O, MeOH and EtOH by various solutes was measured and hence the heats of fusion were calcd. The values, given in cal. per mol., are Et_2O 1400, MeOH 600, EtOH 650. R. E. GIBSON

Residual affinity and coordination. XXVIII. Thermal measurements on derivatives of CuI (MORGAN, *et al.*) **6.** Significance of K ions for the tonus of striated skeletal muscle. VII. The physico-chemical conditions for ion fixation to hydrophile gels (NEUSCHLOSS, WALTER) **11F.** The practical application of phase diagram studies (MEISSNER) **9.**

BOSMAN, VERNON: **The Elements of Physics and Chemistry.** Cape Town, Johannesburg: Juta & Co., Ltd. 295 pp. Reviewed in *Science* **64,** 208(1926).

BRINKLEY, STUART R. AND KELSEY, ERWIN B.: **Laboratory Manual.** Arranged to accompany "Principles of General Chemistry." New York: The Macmillan Co. 159 pp. $1.50.

Catalog of Science and Technology No. III, Pt. 7, Chemistry. London: Henry Sotheran & Co. 207 pp. 2s. 6d. Reviewed in *J. Chem. Ed.* **3,** 1090(1926).

DOBSON, G. M. B.: **The Uppermost Regions of the Earth's Atmosphere.** New York: Oxford University Press. 22 pp. 85¢. Reviewed in *J. Franklin Inst.* **202,** 395(1926).

HADLEY, H. E.: **Everyday Physics.** Sections II–IV. London: Macmillan & Co. 299 pp. 2s. 6d. Reviewed in *J. State Med.* **34,** 495(1926).

HOLMYARD, E. J.: **Science: an Introductory Textbook.** London and Toronto: J. M. Dent & Sons, Ltd. 230 pp. 4s. Reviewed in *Nature* **118,** 297(1926).

NERNST, W.: **The New Heat Theorem.** Translated from German by Guy Barr. 681 Fifth Ave., New York: E. P. Dutton & Co.

Structure et activité chimiques. Vol. II. Reports and Discussions of the second Conseil de Chimie, held at Brussels, April 16–24, 1925, under the auspices of the Solvay International Institute of Chemistry. 55 Quai des Grands-Augustins, Paris: Gauthier Villars & Co. 672 pp. F96. Reviewed in *J. Am. Chem. Soc.* **48,** 2486(1926).

VIVIAN, ALFRED: **Everyday Chemistry.** New York and Cincinnati: American Book Co. 560 pp.

WAITE, A. E.: **The Secret Tradition in Alchemy, Its Development and Records.** London: Kegan Paul, Trench, Trubner and Co., Ltd. 415 pp. 15s.

3—SUBATOMIC PHENOMENA AND RADIOCHEMISTRY

S. C. LIND

The electrical polarity of molecules. C. V. RAMAN AND K. S. KRISHNAN. *Nature* **118,** 302(1926).—On attempting to correlate the elec. double-refraction (Kerr effect) with the optical anisotropy of the mols. detd. from observations on light-scattering, it is found that elec. polar mols. generally exhibit a Kerr effect very large in relation to their optical anisotropy. An explanation of this is given and a calcn. of the permanent elec. moment from the value of the Kerr const. and the const. of depolarization of the scattered light is given for HCl. MARIE FARNSWORTH

The origin of the actinium series. B. WALTER. *Naturwissenschaften* **14,** 794–5 (1926).—Referring to a recent note of L. Meitner (*C. A.* **20,** 3264), W. points out that the observed exception to her rule, U Y being β radiator, therefore heavier than its isotope Th (232), can be explained if it is assumed that U Y and with it the entire Ac series originates from U I. B. J. C. VAN DER HOEVEN

Ionization by radon in spherical vessels. W. MUND. *J. Phys. Chem.* **30,** 890–4 (1926).—The paper is a more recent English version of a detailed paper published elsewhere (*C. A.* **20,** 1756). Assuming the validity of Geiger's law for the variation of ionization along the range of the α-particle and that all Ra A and Ra C, as soon as formed, are deposited on the walls of the spherical vessel, M. computes the ionization produced in such a vessel, following the method initially adopted by Lind for the case where the diam is small compared to the range of the α-particles and extending the method to the case where the diam. is larger than the range of the α-particles.

L. B. LOEB

Pleochroic haloes in biotite. Probable existence of the independent origin of the actinium series. S. IIMORI AND J. YOSHIMURA. *Sci. Papers Inst. Phys. Chem. Research* **5,** 11–23(1926) —A group of haloes which cannot be ascribed to either the U or the Th family of elements exists in some biotites of Ishigure. These Z-haloes are of 3 types as shown by the radial dimension of the outermost ring I. and Y. explain these haloes as originated from either the Ac family alone or the mixed series of Ac and U; the occurrence of such haloes along with the pure U halo indicates the existence of an independent origin for the Ac series. MARIE FARNSWORTH

α-Rays of thorium C + C′ and their behavior by passage through different gases. LISE MEITNER AND KURT FREITAG. *Z. Physik* **37,** 481–517(1926).—Description of a modification of Wilson's app. to make a no of photographs simultaneously and to deduce the exact range of the rays. The paths of the α-particles in different gases are detd. with an accuracy of 1%. The deviations from rectilinearity of the rays are noted and compared with the theoretical deductions from Bohr's equations. The paths and stopping power of the very fast groups are measured accurately. H. R. MOORE

Extremely penetrating α-rays from the active deposit of thorium. K. PHILLIPP. *Z. Physik* **37,** 518–28(1926).—The scintillation method is used to measure the range in air of 2 groups of very fast α-particles from Th active deposit The expts. confirm the existence of groups of 9 5 and 11 5 cm. range. For every 10^6 α-particles of 8.6 cm. range, 65 of the 9 5 cm group and 180 of the 11 5 cm. group are found H. R. M.

α-Rays with a unitary charge. SALOMEN ROSENBLUM. *Compt. rend.* **182,** 1386–8 (1926); cf. *C. A.* **19,** 2448.—The α-particles emitted by Th active deposit are studied by the method of magnetic deviations. Two groups of rays are recorded on the photographic plate, namely those due to Th C and Th C′. The central undeviated ray is due to the α^+-particles. Displacements in mm. are given for the impression produced by this group from the 2 main groups An extreme vacuum is needed to guarantee the occurrence of the α^+-rays The ratio of α^+ to α^{++} under the conditions used is 1/1000, approx. HOWARD R. MOORE

Scattering of α-particles through small angles. D. C. ROSE. *Proc. Roy. Soc.* (London) **111A,** 677–90(1926) —Previous work of Geiger and Marsden, Chadwick and Rutherford, and Rutherford and Bieler has shown from the scattering of α-particles through large angles that the inverse square law of force about the nucleus holds from $3\,2 \times 10^{-12}$ cm. to 1.4×10^{-11} cm., and that it fails below 10^{-12} cm. for light atoms. The present work is an investigation of the law for scattering at distances from 4×10^{-11} cm. to $1\,7 \times 10^{-10}$ cm. from the nucleus in gold—that is, for distances from the nucleus as great as $2^1/_2$ times the diameter of the normal K orbit for electrons. The measurement, which is a nice piece of work and is surrounded by serious difficulties, studies the relative scattering for angles from 2 5° to 8°, using Po as a source and both elec. and scintillation counting methods The conclusion is that for distances of approach of nucleus and α-particle between 3.2×10^{-11} and 1.7×10^{-11} cm the inverse square law holds and the effective nuclear charge is within 5% or less of the at no. times the elementary charge This indicates that under these conditions the screening effect of the K shell is negligible Smaller angles cannot be studied due to multiple scattering and Wentzel's theoretical deductions concerning multiple scattering are roughly confirmed.

L. B. LOEB

Photographic action and the luminescent power of rays emitted by polonium. P. BOSCH. *Arch. néerland. sci.* **IIIA,** 163–201(1925).—The action of α-particles on the photographic plate consists chiefly in the formation of Ag grains (the "mechanical-chem." effect) and the secondary effect of light emitted by collision of the α-particles with the gas mols in the interval between the source of radiation (in this case a Cu plate covered with Po) and the photographic emulsion. The 2 factors must be considered interchangeably in the interpretation of results. Photographic d. measurements with a microphotometer and counting with a microscope give a relation between the developable unit photographic d. and the no. of Ag grains formed per unit of surface. In these measurements a d. of 1.0 is equiv. to 1.94×10^8 Ag grains per cm.^{2} The mag-

nitude of the "gas-luminescent" effect is estd. from data on the decrease in photographic blackening with an increase in distance between the emulsion and active source. The curves calcd. from these data bear a striking similarity to those obtained from results on the relation of the no. of Ag grains formed to the no. of α-particles striking the plate. These measurements confirm those of Kinoshita (*C. A.* 5, 241). The luminescent intensity produced in the chamber is studied as a function of gas pressure. A simple proportionality law does not apply. Luminous effects in air were more pronounced than those in O_2. From the grain data, the no of α-particles emitted per cm. of surface is calcd. to be 2.14×10^7 per sec. HOWARD R. MOORE

Luminescence of water and organic substances subjected to gamma radiation. LUCIEN MALLET. *Compt. rend.* **183,** 274-5(1926)—If water is exposed to a source of Ra (30 mg.), filtered by 2 mm. of Pt, there is produced a white light, having its max. near the radioactive focus. The intensity of the phenomenon increases with the depth of the water up to 8 or 10 cm. With the source on the exterior of the receiver the phenomenon is diminished, but clear. A jet of running water is illuminated. Photographic images show an absorption more intense by glass (1 mm.) than by quartz (5 mm.) and rock salt (5 mm.). The luminescence of water emits an ultra-violet radiation of wave length less than 3000 A. U. EtOH, Et_2O, $CHCl_3$ and CS_2 show a luminescence of the order of that of water. The luminescence of glass is weaker than that of water at 20°. Oils, fats and white wax are equally luminescent. L. D. ROBERTS

Spinning electrons. I. I. RABI. *Nature* **118,** 228(1926).—A short note in which it is pointed out that the hypothesis of spinning electrons leads to certain difficulties in explaining the diamagnetism of such metals as Cu, Ag and the alkalies. W. W. STIFLER

The electromagnetic mass and momentum of a spinning electron. G. BREIT. *Proc. Nat Acad. Sci.* **12,** 451-61(1926)—A math. paper showing that if the whole mass of an electron is electromagnetic its radius must be of the order of 10^{-12} cm. Its angular momentum if conceived of as the angular momentum of the field is less than $h/4\pi$ by a factor of about 20. The electron has a degree of stability due to the action of magnetic forces. The peripheral speed exceeds the velocity of light by a factor of about 20 at its max. A tentative quant. treatment of the energies involved in the Zeeman effect and in "relativity" doublets is given. For the condition of stability and for the peripheral velocity to be of the order of c implies a connection between the value of Planck's const. h and the consts. e, c and m Approx., therefore, elec. charge is quantized. The model as given is imperfect, but the agreement in order of magnitude seems to indicate that the spinning electron has a deeper significance than its spectroscopic utility. MARIE FARNSWORTH

Equations for thermionic emission. P. FREEDMAN. *Nature* **118,** 193-4(1926).—The general equation for thermionic emission by a mixed surface is $\iota = A_0[a_1^{\theta} + a_2^{1-\theta} - 1] T^2 e^{-[b_1\theta + b_2(1-\theta)]/T}$, in which A_0 is a universal const., θ and $1-\theta$ are fractions of surface covered by substances 1 and 2; a_1, b_1, a_2, b_2 are consts. characteristic for the substances. F. endeavors to interpret these consts. and finds that a can be expressed as an exponential function of the mol. vol. $a = Be^{-nv}$ (B and n are consts.); b can be expressed as a hyperbolic function of the mol. vol. $b = C_v^{-m} - K$, in which C, m and K are consts. The "a" equation is based on 6 elements, several of which coincide and is, therefore, rather uncertain. The "b" equation is based on 14 elements (from W to Cs); only one, Na, falls out seriously. B. J. C. VAN DER HOEVEN

The current arriving and velocity distribution with oxide electrodes. H. ROTHE. *Z. Physik* **37,** 414-8(1926).—The velocity distribution of thermions emitted from oxide cathodes in com. three-electrode tubes is detd. by measuring the current coming to the cathode. The Maxwell distribution law is obeyed but the mean speed of the electrons is 1.5 to 2.2 times as great as would be expected according to the kinetic gas theory from the cathode temp. F. O. A.

Natural fluctuations of weak photoelectric currents. EDUARD STEINKE. *Z. Physik* **38,** 378-403(1926).—Using a highly sensitive electrometer of the Hoffman type (sensitivity 2,000 electrons/mm.), the natural fluctuations of weak photoelec. currents have been measured. J. H. PERRY

Atomic rays. G. C. SCHMIDT. *Ann. Physik* **80,** 588-608(1926).—The halide salts of the alk. metals and Ag at low temps. (around 500°) emit + ions and at higher temps.—ions, until at still higher temps. the salt is directly dissocd. into both ions. Previous results with other salts (cf. *C. A.* **19,** 931) are confirmed. MARIE FARNSWORTH

The diffusion absorption of hydrogen canal rays in passage through hydrogen. II. RICHARD CONRAD. *Z. Physik* **38,** 465-74(1926); cf. *C. A.* **20,** 867.—C. computes the

values of the consts. in the formula for scattering, and obtains good agreement with his exptl results. It is necessary to consider not only the effects of both of the nuclei and electrons in H_2, but also repeated collisions, and change of charge on the canal rays as the result to collision B. H. CARROLL

The dispersion law of canal rays in passing through solid bodies. ERNST HOMMA. *Ann Physik* **80,** 609-20(1926). -Expts were carried out to det. the dispersion law for canal rays in passing through solid bodies The dependence of the probably deflection angle on the velocity of the canal rays was studied with a Au foil of 71$\mu\mu$ thickness for 2 velocities, for a foil of double thickness for 3 velocities and for a foil of 3 times the thickness for 1 velocity The canal rav velocities were 3 4·5. The probable deflection angle is inversely proportional to the third power of the velocity of the canal rays For various thicknesses d of the foil, the probable deflection angle increases approx. in proportion to $d^{3/2}$ The dispersion law found for canal rays is in good agreement with the law found for α particles MARIE FARNSWORTH

The dependence of the intensity of x-ray lines on the exciting voltage. A. SMEKAL *Z. Physik* **36,** 638(1926), cf H Stumpen, C. A **20,** 3130- Smekal comments on the fact discovered by Stumpen that there is a sharp increase in the intensity-voltage curve of L series x-ray lines at the K-series crit excitation voltage, and shows why the apparent existence of the "combination defect" led him to advance temporarily a theory of x-ray emission which would not predict the effect found by Stumpen S K. A.

The scattering of positive rays by hydrogen. G. P. THOMSON. *Phil. Mag* [7] **1,** 961-77(1926) --A method is described of measuring the scattering of positive rays in a gas by measuring the blackening caused by the impact of the scattered rays on a photographic plate The density-exposure curve for positive rays is shown to be similar to that for light The angles investigated are of the order of 0 5° and the scattering is shown to be "single" The results obtained differ widely from what would be expected on the inverse-square law, there being an excess of rays scattered through the larger angles. The variation with the speed of the rays is also different from what would be expected The collision relation is found to be of the form $N\alpha\theta^{-2}d\theta$, where N is the chance of a particle being scattered between θ and $\theta + \delta\theta$ by one encounter This relation is what would result from centers of force acting as the inverse cube. S. C. L.

The variation of pressure with temperature in evacuated vessels. N R CAMPBELL *Phil. Mag.* [7] **2,** 369 83(1926) If a well-baked and exhausted glass vessel is carried through a cycle of heating to a temp T_a and cooled to a temp. of T_b, a condition is reached rapidly in which the pressures p_a, p_b at these temps are repeated If T_a is varied while T_b is fixed, both p_a and p_b are functions of T_a which depend also in a complicated manner on the constitution and prepn of the vessel If to this cycle is now added a stage in which the gas is "cleaned up" by discharge, both p_a and p_b decrease with repetition of the cycle, until final values are reached which are again both functions of T_a, but now depend much less on the constitution and prepn of the vessel. If T_a = 120°, T_b = 20°, P_b is of the order of 10^{-6} mm. If the walls of the vessel are coated with a layer of metal (Ni, Mo, W) the statement of the first paragraph remains true: but, while the clean-up still produces a temporary reduction of pressure, it does not produce the progressive permanent change described in the second paragraph. If, in the place of these metals, Mg, Zn, Cu, Ag are used, subsidiary complications enter that are discussed in the text. Attempts to determine by various methods the nature of the residual gas involved in these changes were not very successful, but indicate (in accordance with expectation) that H_2O, and CO_2 are the main constituents. The facts relating to the metal-coated vessels seem in accordance with existing ideas, but throw no light on the still doubtful question as to what is the means by which the discharge promotes absorption of gas The more complicated facts relating to the bare glass vessels require more explanation. A very tentative theory is suggested, according to which the discharge in such vessels, besides promoting absorption, induces a chem. reaction involving the glass which leads to the permanent removal of some of the gas: at the same time the glass is capable of dissolving the gas with the formation of satd. solns. which have at the temp T_a the vapor pressure p_a; gas is continually introduced into the vessel from the outside by diffusion of these solns. through the glass, and prevents p_a from falling below this value in virtue of the removal of gas by the chem. reaction. Some practical conclusions arising from the facts described are mentioned. Permanent low pressures ($< 10^{-6}$ mm) in sealed-off vessels appear to be obtainable only if the glass walls are coated with metal. A reason is given why gas absorbed on a metal surface cannot be removed by prolonging baking of the glass vessel in which it is contd., although it can be removed with great ease and rapidity by heating the metal in the cool glass vessel. S. C. L.

The energy distribution between anode and cathode of the glow discharge. A. GÜNTHER-SCHULZE. *Z. Physik* **37,** 868–80(1926).—The distribution of the energy consumption arising as heat between anode and cathode of a glow discharge is dependent on the electrode distance. The energy transferred to the cathode by the cation is only a small fraction of the total, for the greater part is given up to the gas and electrodes as heat, the cathode receiving a large part at greater electrode distances. M. F.

The transference of energy in collisions between electrons and molecules. J. S. TOWNSEND AND C. M. FOCKEN. *Phil Mag* [7] **2,** 474–95(1926).—After reviewing the apparent conflict between the ordinary laws of momentum and the application of the quantum theory to the energy interchange in collisions between mols. and electrons, T. and F. describe expts. with He and Ne to decide some of the points in question. In both gases an increase in current due to ionization by collision was obtained at potentials considerably below the accepted ionization potentials. Those values (21 v. in He and 17 v in Ne) are to be regarded as upper limits. It was also shown that the increase of current due to photoelec. effect of radiation from gas mols. is small compared with the ionization effect. S. C. L.

Mobility of negative ions and ionization currents in pure argon. MARCEL LAPORTE AND MARIO A. DA SILVA *Compt rend.* **183,** 287 9(1926)—Curves are given which show that the satn current in pure A is obtained with a lower voltage than that required for the satn current in air. L. D. ROBERTS

Transfer of energy from electrons to atoms. F. ZWICKY *Proc. Nat. Acad. Sci.* **12,** 466–70(1926).—A math. discussion of the perturbation caused by an electron passing a linear oscillator with the characteristic frequency $\nu_0 = \omega/2\pi$, with a velocity v MARIE FARNSWORTH

The quantum theory and the behavior of slow electrons in gases. F. ZWICKY. *Proc. Nat Acad. Sci.* **12,** 461–6(1926).—The deviations from the rectilinear motion which slow electrons undergo in the field of force of the atoms are discussed, especially for polarizable atoms and atoms having a permanent asymmetry. M F

Scattering of electrons in ionized gases. F. M. PENNING *Nature* **118,** 301 (1926).—From the collector characteristics of a Hg vapor discharge with a hot cathode, it is concluded that, in the tube, electrons must be present with abnormally high velocities Langmuir (cf *C. A* **20,** 332) expressly mentions that with these discharges no oscillations could be found. In accordance with the results of P., it does not seem impossible that the observed "scattering of primary electrons" is always accompanied and caused by these oscillations MARIE FARNSWORTH

Scattering of electrons in helium. E G. DYMOND. *Nature* **118,** 336–7(1926)—The scattering of electrons in He at a pressure of 0.03 mm. is studied. For an initial velocity of 100 v. there are 2 maxima, one at 5° and the other, much broader, at 60°. For V_i = 50, the principal max. broadens and moves to 20°. At higher velocities this max moves to smaller angles and for V_i = 200, is at less than 2.5° At higher velocities a third max appears at 30°, which is much sharper than the other two. Its position is independent of the velocity. This type of scattering is limited to inelastic collisions. MARIE FARNSWORTH

Emission of electrons and positive ions by metals at the melting point. A WEHNELT AND SERGIUS SEILIGER *Z. Physik* **38,** 443–64(1926).—Expts. with Cu and Ag over a range of temp including the m. p. The method is described in detail. There are distinct breaks at the m p. in the curves of emission against temp., in all cases; the direction is such as to indicate a decrease in the energy necessary to set free the ions on melting. The electron emission decreases on melting in proportion to the increase in resistance. The Richardson formula for electron emission may be used for both phases B. H. CARROLL

Mobility of ions in air. III. Air containing organic vapors. A. M. TYNDALL AND L. R. PHILLIPS. *Proc. Roy. Soc.* (London) **111A,** 577–91(1926).—In Parts I and II (*C. A.* **20,** 2280), one of the authors develops a new crit. method of detg. the mobilities of ions in gases and applies the same to air, proving the existence of the 2 types of positive ions originally discovered by Erikson. In that paper measurements were made on air contg water vapor. The present expts. extend the investigation to mixts. of air and certain org. substances, to wit: H_2O, CH_3OH, C_2H_5OH, C_3H_7OH, C_4H_9OH, $C_5H_{11}OH$, $CHCl_3$, $CH_3(CH_2)_2I$, isoamyl alc., n-octane, 2,7-dimethyloctane, and $C_5H_{11}OH$ and H_2O mixts. The measurements extend from pure air for positive and negative ions to air satd. with the alc. vapors near room temp.—that is, to not more than 40 mm. partial pressure of the alc. in the best cases. *Results.*—(1) In every case, a reduction in the mobility is produced by addn. of vapor though the amt. depends on the nature of the vapor and the sign of the ion. (2) The gradient of the mobility–vapor-pressure curve for

negative ions is steep at low concns. but later decreases and the homologous series of normal aliphatic alcs. shows an increase in value as the series is ascended. The positive ion shows similar effects but the initial drop is less striking. The conclusions are that these results lead one to adopt a cluster theory of ionic nature. [This conclusion is closely in agreement with one arrived at by Loeb from a quant study of mobilities in mixts. of HCl gas and air (*C. A.* **20,** 1174). ABSTR.] The clustering is detd. by the following factors: (1) A "clustering coeff." detd by the combined effect of any permanent elec. moment in the atom and an induced elec. moment in the neutral mol. (2) The "effective diameter" of this cluster, which is detd. by the no. of mols and their size. The dielec. const. being about the same, the cluster would have a larger diam. the larger the mol. The fact that water vapor mols. of small size, with a high dielec. const., can replace the alc. mols. of much greater size and lower dielec const. in a cluster, with a consequent increase in the mobility, bears out these views. L. B. LOEB

The action of radiation on free electrons. E. O. HULBURT *J. Franklin Inst.* **202,** 51–60(1926).—A simple mathematical discussion of the question of the action of radiation on free electrons. H. develops the theory from the classical wave theory and also from the point of view of the quantum theory Applying the correspondence principle to the two resulting equations, H. is able to evaluate the order of magnitude of the diam. of a light quantum, the unknown factor in the quantum equation. This is shown to be about $^1/_{10}$ the electronic diam With this it is possible to discuss the failure of the two recent attempts of Lapp and H A Wilson (results unpublished) to observe a deflection of a beam of electrons by a beam of light, the reason being that in these expts., the chance of impact between quanta and the diffuse electron beam is too small. The positive results of C. T. R. Wilson in his cloud expts and of Bothe in elec. measurements are attributed to the fact that the no. of electrons available in air mols. at normal temp. and pressure which the x-rays could strike made the chance great enough for success. A calcn. of the no of deflected electrons to be observed in these expts. on the basis of the value of the diam of the quantum computed agrees with the observed values. The analysis lead H. to conclude that the concn of the energy in space observed is consistent with the quantum theory rather than with the wave theory. L. B. LOEB

The distribution in space of the directions of emission of photoelectrons. PIERRE AUGER AND FRANCIS PERRIN. *Compt. rend.* **183,** 277–80(1926) —A law of distributions of the directions of emission applying to incident x-rays of low frequency is proposed. This law is imposed by the following conditions (*a*) For an incident polarized wave the probability of the departure of a photoelectron in an elementary cone depends, if the frequency is low, only on the angle which the cone makes with the elec. vector of the wave. (*b*) In superposing the distribution of directions of emission corresponding to two waves in the same direction, frequency and intensity, polarized in perpendicular planes, a distribution of revolution around the direction of propagation should be obtained. When the photoelec. effect is produced by radiation of high frequency, condition (*b*) should hold, but not condition (*a*). L. D ROBERTS

The photoelectric emission from platinum as influenced by heating. L. A. WELO. *Phil. Mag.* [7] **2,** 463–73(1926).—W. is now in agreement with Herrmann (*C. A.* **19,** 3428) that the photosensitiveness of Pt becomes less as the temp. of heating is raised. Great differences of various samples of Pt are now reported and some expts. on the influence of scraping the surface after the attainment of low sensitiveness are described. The influence of Hg vapor is also considered as well as the effect of exposure to gases subsequent to reduction of sensitivity by heating. S. C. L

The x-ray spectrographic detection of the rare earth Z = 61. U. DEHLINGER, R. GLOCKER AND E. KAUPP. *Naturwissenschaften* **14,** 772–3(1926). —The authors give data on x-ray measurements on a Nd-Sm prepn. from R. J. Meyer (so far unpublished). The prepn. contained Sm, Gd, Nd, Pr, Ce and La and traces of Te and Bi With 2 Seemann spectrographs the K spectrum was carefully detd. For the interpretation the recent detns. of Cork and Stephenson (*C. A.* **20,** 2943) on rare-earth spectra have been used. Three lines of the $Z = 61$ element were definitely found, freed from overlapping lines of the accompanying metals. They are $K\alpha_2 = 324.2$ X. U.; $K\alpha_1 = 320.1$ X. U.; $K\beta = 281.5$ X. U The element is rather volatile in the form of Meyer's prepn.; ignition for H_2O and CO_2 removal caused a weakening of the lines as compared with intensity of the Sm lines. B. J. C. VAN DER HOEVEN

A method of studying the behavior of x-ray tubes. R. C. RICHARDS. *Proc. Roy. Soc.* (London) **112,** 280–8(1926).—The efficiency of the tube, coil and break is studied by finding the av. for the 3 variables—current (*C*), voltage (*V*) and radiation (*I*), for a large no. of breaks of instantaneous values of these variables. There is little,

if any, difference of phase between the variables. The ionization output is concd. in a narrow region coinciding with the current and potential max. Seven or 8 degrees of a break cycle are alone fruitful in producing radiation; in a break provided with 4 contacts, therefore, only about 1/10 of the time spent in operation is spent in producing reasonable quantities of x-radiation. MARIE FARNSWORTH

Spectroscopy of long wave-length x-rays. A. DAUVILLIER. *Compt. rend.* **183,** 193-5(1926).—The method previously described (*C. A.* **20,** 2285) for measuring x-rays of long wave length has given the following results. The K series of the elements begins with B, for which $K\alpha_2$ has a wave length 73.5 A. U. Be, Li, He and H, therefore, have no characteristic x-rays. The $K\alpha_{1,2}$ line of O falls at 24.8 A. U. The $K\alpha$ ray of C has been followed to the 3rd order corresponding to 138 A. U. The $L\alpha$ ray does not exist for P nor S, but beginning with Cr it is still feeble for Fe. The $M\alpha$ ray does not appear for Zr, Mo, Ba, but is very strong for Ta and W. For Ba, lines have been observed which correspond to members of the N and O series. C. C. KIESS

Laboratory methods of analyzing spectra, with applications to atomic structure. A. S. KING. *Sci. Monthly* **23,** 246-52(1926).—An address. C. C. KIESS

The spark spectrum of lithium. SVEN WERNER. *Nature* **118,** 154-5(1926).—The spark spectrum of Li is characterized by 2-series systems analogous to the ortho-He and par-He spectra, resp. The ortho-Li spectrum has already been described (*C. A* **20,** 1560). In the present paper is given a classification of the lines belonging to the singlet system of Li II, or par-Li. The *p*-spectrum as a whole is weaker than the *o*-spectrum, which is similar to the behavior of He. C. C. KIESS

The effect of helium on the intensity of the mercury spectrum. WM. G NASH. *Science* **64,** 190(1926).—The spectrum of Hg was studied as influenced by inert and by active He In a 3-electrode tube operated at approx. 19 v. the Hg lines were observed to increase in intensity with increasing pressure of He To study the effect of radiating He the tube was operated at 99 v. Beyond a pressure of 0.06 mm. the inert and radiating He produced approx. the same change in intensity. C. C. KIESS

Remarks on P. Günther and G. Wilcke's article: Contributions to Röntgen spectroscopy. II. V. M. GOLDSCHMIDT. *Z. physik. Chem.* **122,** 250-3(1926).—A criticism of the analysis of a gadolinite sample offered by G. and W. as illustrative of their method of Röntgen spectro-analysis (*C. A.* **20,** 2281). **Reply. II.** PAUL GÜNTHER AND GERTRUD WILCKE. *Ibid* 254 6(1926).—The criticisms of Goldschmidt are accepted and the conclusion is drawn that for the analysis of complex chem. systems 2 Röntgen spectrograms, of different exposure times, are desirable for deriving the data from the strong and weak lines, resp. C. C. KIESS

The absorption spectrum of hydriodic acid in the ultra-violet. K. F. BONHOEFFER AND W. STEINER. *Z. physik Chem.* **122,** 287-92(1926).—The ultra-violet absorption band of HI between 3000 A. U. and 2300 A. U. was found to be continuous. The source of white light was either a Gehlhoff lamp or the continuous spectrum of H, observed through a quartz cell contg. HI at pressures ranging from 25 to 0.2 mm Hg. The continuous character of the HI band is accounted for on the assumption of a primary dissocn. of the mol. C. C. KIESS

The spectrochemistry of compounds containing nitrogen. II. KARL V. AUWERS AND WALTRAUT ERNST. *Z. physik. Chem.* **122,** 217-49(1926).—Tables of data for d_4^{20}, n_{He}^{20}, $E\Sigma_\alpha$, $E\Sigma_{\mathrm{D}}$, $E(\Sigma_\beta-\Sigma_\alpha)$, $E(\Sigma_\gamma-\Sigma_\alpha)$ and $E\Sigma_{\mathrm{D}}^{20}$ are given for the following classes of compds.: pyrazoles, isoxazoles, oxazoles, thiazoles and isothiazoles, imidazoles, amidines and cyanamides. Additional tables present data for these compds. similar to those given in the first paper (*C. A.* **19,** 2911). C. C. KIESS

Ionization of mercury vapor as a function of the intensity of exciting light. G. W. GIDDINGS AND G. F. ROUSE. *Proc. Nat. Acad. Sci.* **12,** 447-8(1926); cf. *C A.* **19,** 3423.—The ionization current as a function of the light intensity is computed from the equation $C_0/C_1 = (I_0/I_1)^n$, where C_0 and C_1 represent the original and reduced ionization currents and I_0 and I_1 represent the corresponding light intensities. The variation of n as a function of vapor pressure and of temp. is being investigated and some preliminary results have been obtained. MARIE FARNSWORTH

The theory of the Bucherer experiment. N. A. SMIRNOV. *Ann. Physik* **79,** 227-36(1926).—A simple geometrical treatment of the theory of the expt. (*C. A.* **3,** 398) is given. F. R. B.

The alleged decomposition of aqueous ammonium nitrite solutions by light. MARSHALL HOLMES. *J. Chem. Soc.* **1926,** 1898.—It is concluded that Berthelot and Gaudechon (*C. A.* **5,** 2025) were in error in stating that N_2 is evolved from NH_4NO_2 in the study

of photo-reactions Expts. in both the light and the dark show the effect to be purely that of a thermal reaction. MERRILL FENSKE

The spectrum of hydrogen. A. SOMMERFELD AND A. UNSÖLD. *Z. Physik* **38,** 237–41(1926)—Certain statements previously made (*C. A.* **20,** 2119) concerning the intensity of fine structure components are retracted and replaced by values calcd. according to the Schrodinger wave-mechanics. W. F. MEGGERS

Zeeman effect in the scandium spectrum. S. GOUDSMIT. *Naturwissenschaften* **12,** 743–4(1924). H. G.

Further spectroscopic studies on the luminous vapor distilled from metallic arcs. LORD RAYLEIGH *Proc Roy. Soc.* (London) **112A,** 14–29(1926).—Observations on the jets of luminous vapor distd from metallic arcs are described in extension of the results reported previously (*C A* **19,** 2603) It is shown that the appearance of high-series members in the luminous vapor is due to their narrowness In the arc these lines are broadened by Stark effect of interatomic fields, so as to overlap one another. Enhanced lines occur in the distd. vapor of Hg, Mg and Ca, though in diminished intensity relative to the arc lines In some cases, *e g*, Mg, they fade out very rapidly compared with the arc lines The resonance line of Hg, $1S-2p_2$, gains intensity relative to all other lines as the vapor moves away from the orifice The same is true of Ca, but the corresponding line of Mg behaves in the opposite manner for some unknown reason. A luminous jet of one metallic vapor is able in many cases to excite the vapor of another metal injected into it. As a rule such excitation does not take place unless the ionization potential of the first metal exceeds that of the spectrum line in question, but there appear to be some exceptions to this rule and possible explanations are discussed W F MEGGERS

Atomic states and spectral terms. J. C MCLENNAN, A B MCLAY AND H. GRAYSON SMITH *Proc Roy Soc* (London) **112A,** 76–94(1926)—The foundations have recently been laid for the interpretation of spectra in terms of at. states and it appears that one can predict, almost with certainty, the structure and chief characteristics any optical spectrum of the atom of any element when the extra nuclear electron configuration that gives rise to it is known. Conversely, if the characteristics of any optical spectrum of an atom be known, it is possible definitely to describe the extra nuclear electronic states of the atom involved in the production of such spectrum. The Heisenberg-Hund theory of spectral terms (*C A* **20,** 18) is briefly reviewed, and without going into the mathematical development, 14 rules which serve as a basis for the method of detg. the lowest spectral energy levels involved in the structure of the arc spectrum or in that of any spark spectrum are given The procedure to be followed in calcg. the term types corresponding to a given electron configuration is illustrated by notes on the spectra of C, N, O, Ne, Ti, Ni, Zr, Hf, Th, Nd, U, W and a table is given showing the electronic configurations and lowest spectral levels for each of the 92 chem. elements. W. F. MEGGERS

The structure of the arc spectrum of gold. J. C. MCLENNAN AND A. B. MCLAY. *Proc. Roy. Soc.* (London) **112A,** 95–110(1926)—With the aid of suggestions from the Heisenberg-Hund theory (cf. preceding abstr.) some unusual features of the Au arc spectrum previously reported (*C. A* **20,** 15) are now fully explained and the classification of the spectrum is extended. Absorption expts show that the lowest energy level is that designated as 1^2S_1 and the next lowest levels comprise an inverted doublet-D term. The rule that quartet terms are lower than doublet terms of the same type is violated in Au. W. F. MEGGERS

The series spectra of palladium. J. C. MCLENNAN AND H GRAYSON SMITH. *Proc. Roy. Soc.* (London) **112A,** 110–28(1926)—In an earlier paper (*C. A* **20,** 2457) McL. and S gave a preliminary analysis of the arc spectrum of Pd. This is now extended and brought into better agreement with the theoretical considerations of Hund (cf. second preceding abstr.). Series of terms following approx. formulas of the Rydberg or Ritz type will be produced by configurations with the electrons in orbits of the same azimuthal quantum nos., but with increasing values of the total quantum no of one of the electrons Whereas the normal state of the Pd atom with 10 electrons of the 4_3 type is represented by a singlet —S spectroscopic term, successive configurations of 9 electrons of the 4_3 type give rise to a series of triplet- and singlet-D terms. When the series electron is completely removed there remains a singly charged Pd ion with an outer configuration of 9 electrons in 4_3 orbits. The energy of this configuration must therefore represent the limit of the series, but at the same time it represents a possible configuration of the spark spectrum and illustrates how the limits of the series of the arc spectrum can be assocd. with the low terms of the spark spectrum. Thus the series $^3D_{1,2}$ converge to the limit $^2D_2$ and $^3D_3$ and $^1D_2$ to the limit $^2D_3$. Three members of

these series were found in Pd and the limits from the Rydberg formula are 70,902 and 67,387 cm.$^{-1}$, resp. The difference between these limits is 3515 cm.$^{-1}$, which should be equal to the frequency difference of the low doublet-D term of the spark spectrum. A difference of 3512 4 cm.$^{-1}$ was actually found among Pd spark lines. This defines the normal state of the ionized Pd atom with 9 electrons in 4_3 orbits. Other terms only slightly higher have been identified with most of those predicted for the configuration of 8 electrons in 4_3 orbits and one in a 5_1 orbit. Combinations of these with higher terms account for several hundred Pd spark lines with wave lengths from 3882 98 to 1535.4 A. U. W. F. MEGGERS

Intensity measurements in the iron spectrum. II. J. B. VAN MILAAN. *Z. Physik* **38**, 427-36(1926).—Previous work (*C A* **20**, 1355) on the measurement of line intensities of Fe I is continued and results are given for multiplets of the types $f'-d^2$, $p'-d^2$, $\overline{d}-d$, $f'-\overline{f^2}$ and $d'-f'$. For the first 2 types the observed intensities are in good agreement with the theoretical values based on the sum rule. For multiplets of the types $\overline{d}-d$ and $\overline{f'}-f$ the agreement between observed and theoretical intensities is not very good C. C. KIESS

The ratio of the intensities of the components of the apparent helium doublet. D. BURGER. *Z. Physik* **38**, 437-9(1926) —Intensity measurements of the He lines $2p-4d$, $2p-5d$, $2p-3s$, $2p-4s$ and $2p-5s$ show that in the mean the intensity of the fainter component is about 14% that of the stronger. A similar ratio was found for the components of the yellow line 5876 A U. = $2p-3d$. If the line were a true doublet the ratio should be 2.1; but the observed value is approx 8·1, which is in harmony with the idea that the line is really a triplet for which the intensity ratios 5.3:1 hold. The apparent ratio 8 1 results from the fact that the stronger line and one component are so close as to be unresolved C. C. KIESS

Width of the absorption lines in irradiated sodium vapor. W. KUHN. *Z. Physik* **38**, 440 2(1926).- No broadening of the Na D-lines in absorption was observed when cool Na vapor was irradiated with intense light from a quartz Na-lamp. Conclusion: Atoms which are irradiated with light of frequency differing from their characteristic frequency and which scatter this light do not experience any change in their energies sufficient to bring them to a new stationary state. C. C. KIESS

The fluorescence bands of potassium and sodium. PETER PRINGSHEIM. *Z. Physik* **38**, 161-75(1926) —The fluorescence spectra of K and Na and a Na-K mixt. were excited by exposing their vapors to white and to monochromatic light Measurements of the red Na band groups indicate that a const $\Delta\nu$ = 115 cm $^{-1}$ seps the band heads, which differs from that found by Wood for the resonance series excited by the red Li line. In the spectra of the Na-K mixt appears a new series of bands in the yellow in addn. to those belonging to Na and K alone, which are ascribed to a loosely bound K Na mol. because the $\Delta\nu$'s sepg. the band heads do not occur in the characteristic Na or K bands. All the bands observed are ascribed to polyatomic mols. of the alk. metals, and not, as has been suggested, to org. impurities. C. C. K.

Röntgen spectra and chemical composition. ERIK BACKLIN. *Z. Physik* **38**, 215-26(1926).—A continuation of previous work (*C. A.* **19**, 3063). New results are given for the displacements of the $K_{\alpha_1\alpha_2}$ lines, the K_{α_3} and K_{α_4} lines, and the K_{β_1} lines of the light elements S and Si when they occur as constituents of compds. In general the lines are of shorter wave length when the emitting element is in combination than when uncombined C. C. KIESS

Intensity distribution in the fine structure (satellites) of the cadmium triplet $2p_i-2s$. J. L. SNOEK AND T. BOUMA *Z. Physik* **38**, 368-9(1926) —The intensities of the satellites of the Cd lines 4678 A. U , 4799 A. U. and 5086 A U. were measured by the method previously employed for the lines of Hg (*C. A.* **20**, 2458) to which the Cd lines are analogous The satellites have in the mean 10, 16 and 16% the intensities of the main lines, resp C. C KIESS

Effect of electric field on the spectral lines of zinc and cadmium. YOSHIO FUJIOKA. *Sci. Papers Inst. Phys. Chem. Research* (Japan) **5**, 45-53(1926). (In English.)—A discharge tube is described for observing the Stark effect of metals by the Lo Surdo method. Applied to Zn and Cd it was found that lines belonging to the diffuse series are displaced red-ward in the elec. field. The amts. of the displacements were measured and are tabulated. In addn., the elec. field brings out many lines forbidden by the selection principle for azimuthal quantum nos. Wave lengths and series classifications of these lines for Zn and Cd are given. C. C. KIESS

Spectroscopic study on the discharge in helium. T. TAKAMINE. *Sci. Papers Inst. Phys Chem. Research* (Japan) **5**, 55-61(1926). (In English.)—The effect of exploding

wires in an atm. of He was to give the appearance of self-reversal to the lines 4922 A. U. and 4472 A. U. of the arc spectrum, and of 3203 A. U. of the spark spectrum. The explanation of the phenomenon, however, is that in each case forbidden lines with wave lengths differing little from the strong lines are excited by the interatomic elec. field produced by the very closely packed atoms at high c. ds. When a condensed discharge is passed through a capillary tube contg. He at pressures up to 1 atm. similar reversal phenomena are observed for the lines 6678 A. U., 5876 A. U. and 3889 A. U. Inasmuch as no forbidden lines lie near them the phenomenon is regarded as a true reversal effect, although a Stark effect resulting from the interatomic field may account for a part of it.
C. C. KIESS

Optical properties of ethylene isomers; quantitative study of the ultra-violet absorption spectra of the dihalogen derivatives of ethylene. J. ERRERA. *J. phys. radium* [6] **7,** 215-6(1926).—Graphs illustrate the ultra violet absorption of some dihalogen derivs. of ethylene, CHI=CHI, CHI=CHCl, CHBr=CHBr, CHCl=CHBr and CHCl=CHCl. The absorption of the *trans*-isomers is greater than that of the *cis*-isomers, the difference between them increasing with decreasing wave length.
C. C. KIESS

The Stark effect of the anode rays of lithium. ANDRÉ POIROT. *J. phys. radium* [6] **7,** 217-24(1926).—The Stark effect of Li was measured quantitatively for an intense and uniform elec. field for the production of which the methods and app. are described. The light source consisted of the positive rays issuing from the anode of the discharge tube. In particular the line 4602 A. U. was observed to split into 3 normal and 3 parallel components. The measured sepns. of the components with increasing field strength are tabulated. A different type of resolution was observed for the line 4132 A. U., but the details of the measurements are not given.
C. C. KIESS

Some relations between optical spectra of different atoms of the same electronic structure. II. Aluminum-like and copper-like atoms. D. R. HARTREE. *Proc. Cambridge Phil. Soc.* 23, 304-26(1926).—More general theoretical formulas than those derived in a previous paper (*C. A.* 19, 778) are developed for the relations between corresponding terms of different atoms of the same electronic structure. In particular these give expressions between the quantum defects of orbits which penetrate the atom core, and the charge on the atom core; or between the quantum defects and the mean radius of core orbits of max. principal quantum no. The theoretical results are in good agreement with observed results derived from the spectra of Al I, Si II, P III and S IV; and from those of Cu I, Zn II, Ga III and Ge IV.
C. C. KIESS

The argon spectrum in the extreme ultra-violet. H. B. DORGELO AND J. H. ABBINK. *Naturwissenschaften* **14,** 755-6(1926).—The following lines were found in the ultra-violet A spectrum (vacuum spectrograph, positive column or glow discharge) with estd. intensities in glow discharge. 1066.75 (all ± 0.1) A. U., 9, 1048.30 A. U., 10 (the 2 resonance lines $1p-2s_1$ and $1p-2s_2$), 932.06 A. U., 7, 919.79 A. U., 8, 894.31 A. U., 4, 879.97 A. U., 5, 876.10 A. U., 4, 869.75 A. U., 5, 866.84 A. U., 5; 842.79 A. U., 3; 834.98 A. U., 3, 834.42 A. U., 4, 826.34 A. U., 4, 825.36 A. U., 4, 820.12 A. U., 2; 816.27 A. U., 3, 809.99 A. U., 0, 807.65 A. U., 0 (the last two are very faint), 806.46 A. U., 2; 797.68 A. U., 2. The following lines are given under reserve: 964.72; 808.88; 803.80; 801.33. In the glow discharge (hollow Cu or Ni cathode) lines at 908.31; 887.45; 883.22, 879.62, 878.78, 875.56; 871.11 were registered. Considerable analogy between the A and Ne spectra seems to exist (cf. Meissner, *C. A.* **20,** 2728). From high *s* and *d* terms ($J = 3/2$) most of the lines can be calcd. as combinations with a ground term ($J = 1/2$). The excitation potentials of the $2s_5$, $2s_4$, $2s_3$ and $2s_2$ levels were calcd. to be, resp., 11.49, 11.57, 11.67 and 11.78 v., in good agreement with the value (11.5 v.) obtained by Hertz and Kloppers (*C. A.* **19,** 1533) for the first excitation potential. The calcd. excitation potentials for the two $2p$ levels 12.85 and 13.12 v. check with the second exptl. value of 13.0 v. It appears from the lines between 894 and 866 that a new group of *d* (and *s*) terms is situated between $2p$ and $3p$, their excitation potentials agree with the exptl. value of 13.9 v. found; their combination with $2p$ will yield ultra-red lines so far unknown. Of the 3 lines found by Saunders (*Bull. Am. Phys. Soc.* **18,** (1926)) only the 932.09 and 919.80 were observed; they are relatively faint in the column discharge.
B. J. C. VAN DER HOEVEN

The infra-red secondary spectrum of hydrogen. T. E. ALLIBONE. *Proc. Roy. Soc.* (London) **112A,** 196-212(1926).—Photographic plates sensitized with dicyanine were used with a plane diffraction grating to record the many-lined spectrum of H in the infra-red. About 320 lines were observed between H_α (6562.82 A. U.) and 8349.52 A. U. A complete list of wave lengths and vacuum wave-nos. is given. An extension of Fulcher's first band is made in 7 series. The effect of a transverse magnetic field of

7000 gausses was studied; no selective effect could be detected, but there was a general broadening of all the lines. W. F. Meggers

Studies of the chemistry of hydrogen. III. The electron affinity of hydrogen. Georg Joos and Gustav F. Hüttig. *Z. Elektrochem.* **32**, 201–4(1926); cf. *C. A.* **20**, 1187.—The electron affinity E of H can be derived from Q of the reaction Na_{solid} + $^1/_2H_{2gas}$ = NaH_{solid} + Q cal. by suitable subtraction or addn., resp., of the values ($-V$) for the heat of evapn., ($-J$) for the ionization energy, both of Na, ($-D$) for the dissocn. heat of $^1/_2H_2$ and U for the lattice energy of NaH: $E = D + Q - U + V + J$. From Moer's detns. (*C. A.* **15**, 2594) values for Q are taken; V is extrapolated to zero abs. from data of van Laar (*C. A.* **20**, 3255). V_{Na} = 27.3 cal., V_{Li} = 41.3 cal.; J from spectroscopic data is 124 cal. for Li, 117 cal. for Na. On the basis of Born's ionic lattice theory the exponent n of the interionic repulsion at short distances was calcd. (Saerens, *C. A.* **19**, 913) to be 6 for alkali hydrides (excepting LiH), giving the following values for U: NaH 172.6 cal., KH 138.9 cal., RbH 145.8 cal., CsH 139.4 cal. The resulting values in the same order for ($E-D$) are —11 cal., + 0.6 cal., —13 cal., —14 cal., av. —10 cal. If D is taken as 33 cal. (av. of the best detns.) the electron affinity of H is 23 cal. B. J. C. van der Hoeven

Postscript to our communication on electron affinity of hydrogen. Georg Joos and Gustav F. Hüttig. *Z. Elektrochem.* **32**, 294–5(1926), cf. preceding abstract.—From the old Bohr model for H^-, He or Li^+ atoms and ions (nucleus and two electrons all in one plane with circular orbit) the ratio between observed and calcd. electron affinities is for He and Li^+ 0.85 and 0.82, resp. Assuming the same ratio for H^- gives an electron affinity for H of 33 cal. B. J. C. van der Hoeven

Measurements in the absorption spectrum of *p*-benzoquinone vapor. I. Lifschitz and E. Rosenbohm. *Z. Physik* **38**, 61–71(1926).—*p*-Benzoquinone vapor has 3 absorption regions between 5000 and 2000 A. U. Two of these were investigated with a quartz spectrograph, about 400 sharp band lines were measured in the long-wave region 5070–4110 A. U. and 26 wider bands between 3058 and 2623 A. U. In general quinone vapor behaves spectroscopically like quinone solns. There is evidence that the long-wave absorption may be ascribed to the relatively undisturbed built-in C^+ electrons while O is responsible for the shorter wave absorption. W. F. Meggers

Investigation of the anomalous dispersion of excited gases. R. Ladenburg, H. Kopfermann and Agathe Carst. *Sitzb. Preuss. Akad. Wiss.* **1926**, 255–73.—Anomalous dispersion at many spectral lines of He, Ne, Hg and H when these gases are excited by d. c. is produced and quantitatively measured by the method of horizontal interference bands. With the aid of the quantum-theoretical dispersion formula of Ladenburg and Kramers and the f-sum law of Reiche-Thomas the transition probability of various quantum jumps, the no. of atoms in the excited states, and its dependence upon current strength, pressure and temp. are detd. With weak current the metastable states preponderate, with increasing current the no. of spontaneously decaying states grows more rapidly than the metastable, and finally produces (*e. g.*, among the adjacent *s*-states of Ne which belong to a triplet) a statistical equil. After this no further change of atom no. in various states occurs with increasing current, and the ratios of atom nos. are essentially detd. by their quantum nos. as expected according to the laws of quantum statistics. W. F. Meggers

The arc spectrum of europium. Measurements made at normal pressure between λ3500 and λ3100 A. U. S. Piña de Rubies. *Compt. rend.* **183**, 385–7(1926).—The wave lengths of about 80 lines observed in the arc spectrum of Eu, prepd. by Urbain, but not given in any other tables, are published in the interval 3485.8 to 3105.2 A. U. W. F. Meggers

The spark spectrum of potassium. T. L. de Bruin. *Z. Physik* **38**, 94–103(1926); cf. *C. A.* **20**, 2616.—The spark spectrum of K, produced by the electrodeless discharge, was photographed in the region 2300 to 8000 A. U. with a concave grating of 2 m. radius. According to the displacement law the spectrum of ionized K should show a structure resembling that of a neutral rare gas, especially A. The arc spectrum of A has not yet been arranged in series but a comparison may be made with Ne, the spectrum of which contains 10 principal series. About 150 lines of K have indeed been found to result from combinations of 30 terms like those for Ne. A ten-fold P-term is found; the P-terms carry the same inner quantum nos. as the P-terms of Ne, and the P-differences or sepns. follow the same law. W. F. Meggers

The photochemical characteristics of chromates and other compounds. II. I. Plotnikov and M. Karshulin. *Z. Physik* **38**, 502–10(1926); cf. *C. A.* **20**, 4459.—Detns. of the absorption spectrum down to 200 mμ, and the region of photochem. sensitivity, in collodion films, for the following: K_2CrO_4 and $(NH_4)_2CrO_4$ with MeOH

as acceptor; $Fe(CO)_5$; Br_2 with cinnamic acid as acceptor; I_2 and I_2 in KI. Maxima of photochem. action were observed in all cases, even those with continuous absorption in the ultra-violet. B. H. CARROLL

Dissociation of the water molecule. HERMANN SENFTLEBEN AND ILSE REHREN. *Z. Physik* **37**, 529–38(1926).—The phys. method previously applied (*C. A.* **20**, 144) to measure quant. the H atoms produced by collisions of the second kind with excited Hg mols. (depending on increase in heat cond. in the gas mixt.) is used to measure the dissocn. equil. between H_2O and H, O and OH. The resonance energy of the Hg atoms is effective in producing the transformation, indicating that the heat of dissocn. of H_2O is considerably less than 112 kg. cal. per g. mol. The equil. is approached from the other side by subjecting an equi-mol. mixt. of H_2 and O_2 to collisions of the second kind. A partial synthesis to H_2O vapor takes place. The results are discussed in the light of Hund's theories of mol. structure (cf. *C. A.* **19**, 1985). HOWARD R. MOORE

Electron affinity of oxygen. HERMANN SENFTLEBEN. *Z. Physik* **37**, 539–46(1926); cf. preceding abstr.—The electron affinity of O_2 is a composite quantity. The binding of the first electron to the O atom is equiv. to a positive energy absorption of 164 k. cal. per g. mol.; the binding of the second electron is equiv. to an energy evolution of —204 kg. cal. The resultant electron affinity is thus — 40 kg. cal. H. R. MOORE

Optical determination of the heat of dissociation of halogens. HEINRICH KUHN. *Naturwissenschaften* **14**, 600(1926).—The edges of the band spectra of I_2, Br_2 and Cl_2 converge towards the violet up to the point where continuous absorption sets in. According to Franck (*C. A.* **20**, 548) this convergence point signifies a dissocn. of the halogen mol. into a normal and an activated atom, *i. e.*, $h\nu_c = D + A$. Other spectral evidence supports this view (Dymond, *C. A.* **20**, 871; Witmer, *C. A.* **20**, 2115). The activation heat $A = 2p_2 - 2p_1$ can be estd. from inert gas terms (Franck, *l. c.*, Turner, *C. A.* **20**, 2613) and thus calcn. of D is possible. For I_2, Br_2 and Cl_2, resp.: ν_c = 4995 A. U., 5107 A. U. and 4785 A. U., A (Turner) = 0.937 v., 0.454 v. and 0.109 v.; D calcd. = 1.53 v. (35.2 cal.), 1.96 v. (45.2 cal.) and 2.468 v. (56.9 cal.). These values agree well with the D values found in a thermodynamic way and are considerably more accurate. B. J. C. VAN DER HOEVEN

The photolysis of acetaldehyde and of acetone. E. J. BOWEN AND H. G. WATTS. *J. Chem. Soc.* **1926**, 1607–12.—An energetical study of the decompn. of AcH vapor and of Me_2CO in both the gaseous and liquid phases. A uranyl sulfate-oxalic acid actionometer, standardized against a Moll thermopile, is used to measure the amt. of radiant energy absorbed. With AcH, pressure changes due to formation of CH_4 and CO give the amt. of chem. change. Photo-polymerization to par- and metaldehyde is a parallel change. With Me_2CO vapor, the rate of chem. change is followed with a manometer since CH_4 and AcOH are evolved in equimol. quantities. The extent of change in the liquid phase is detd. by I_2 titration, as well as estn. of the AcOH by dil. baryta soln. For both reactions in the liquid phase approx. 2 mols. are transformed per quantum absorbed. The titer of AcOH in the liquid phase corresponds to less than 1 mol. per 5 $h\nu$ absorbed. HOWARD R. MOORE

Studies with the microbalance. IV. The photochemical decomposition of silver iodide. E. J. HARTUNG. *J. Chem. Soc.* **1926**, 1349–54; cf. *C. A.* **19**, 2453; **20**, 2629.—Thin films of AgI, heated to 400° to drive off occluded matter, are exposed in sunlight for various periods in the presence of a suitable I_2 absorbent. The amt. of photochem. change is followed with a Steele-Grant microbalance. Ag and I_2 are the end products of the decompn. The max. loss of total I_2 was procured in a vacuum; for pressures of H_2, N_2 and O_2 of 10 mm. in the reaction vessel the per cent decompn. values were 91.6, 88.5 and 94.0, resp. HOWARD R. MOORE

Effect of infra-red radiation on the combustion of gaseous mixtures containing nitrogen. W. T. DAVID, S. G. RICHARDSON AND W. DAVIES. *Proc. Leeds Phil. Lit. Soc.* **1**, 37–9(1926); cf. *C. A.* **19**, 3059.—When N_2 of the air in inflammable gaseous mixts. is replaced by A, O_2, CO_2 or the combustible gas itself, infra-red radiation gives no effect on the rate of combustion. This suggests, during the combustion in closed vessels, a temporary association between N_2 mols. or N oxides and those of the combustible gas, tending to retard combustion. This association is inhibited when the mols. of the combustible gas acquire vibratory energy by absorption of infra-red, with a resultant increase in the rate of combustion. H. R. MOORE

The effect of radiations on reactions in gels. A. F. G. CADENHEAD. *Can. Chem. Met.* **10**, 201–3(1926).—Davies' observations (cf. *C. A.* **17**, 1743, 3820) on the effect of light on the rate of reduction of Au have been verified and his work has been extended by means of x-rays. C. agrees with Davies that the banding on reduction due to colloidal Au is not a true Liesegang phenomenon. MARIE FARNSWORTH

The photographic effect of slow electrons. G. F. Brett. *Proc. Leeds Phil. Lit. Soc.* **1**, 1–5(1926).—For electrons of velocity less than 1000 v., it is necessary to sensitize the plates with fluorescent oils. The emulsions are covered with a soln. of tap grease in Et_2O. Exposures are made for $^1/_2$ to $^1/_{12}$ min. for an anode filament current of 2–3 milliamp. The speed of the incident electrons is estd from the position of the image on the plates. An untreated Kodak duplitized film gave only the faintest marking with 100 v. electrons, while those coated with grease layers maintained sensitivity to 65-v. electrons. Howard R. Moore

Chemical action of gaseous ions produced by α-particles. IX. Saturated hydrocarbons. S. C. Lind and D. C. Bardwell. *J. Am. Chem. Soc.* **48**, 2335 51(1926); cf. *C. A.* **20**, 2459.—Under the action of radiation from radon in a gaseous mixt., C_2H_6, C_3H_8 or C_4H_{10} each condenses with the elimination of H and CH_4 (approx. $5H_2 \cdot 1CH_4$) to give higher hydrocarbons, gaseous, liquid or solid, satd. and unsatd. CH_4 eliminates H_2 only. The higher the hydrocarbon, the more readily the liquid or solid phase is attained. Analysis of the gaseous products shows the presence of all satd members either higher or lower than the original one. Unsatd. compds are absent in the gaseous state, which indicates immediate condensation of a freshly formed unsatd hydrocarbon to form liquid; a theory is proposed for this behavior. The resulting liquids contain a large proportion of unsatd. hydrocarbons. The ratio $M_{HC}/N_{(ions)} = 2$ -is interpreted as the clustering of 2 hydrocarbon mols per each ion pair. The permanent bond is established by eliminating H_2, or $2H_2$ or CH_4 and probably in other ways The ratio—$\Delta HC/\Delta H_2$ = about 1.33—indicates a fairly even division between formation of satd. and unsatd. hydrocarbons. Complete oxidation of CH_4 or C_2H_6 takes place in 1 step, indicating the following ion-cluster reactions per ion pair: $(O_2 \cdot CH_4 O_2)^+ + (O_2^- \cdot CH_4 \cdot O_2) = 2CO_2 + 4H_2O$ and $(O_2 \cdot O_2 \cdot C_2H_6 \cdot O_2 \cdot O_2)^+ + (O_2^- \cdot C_2H_6 \cdot O_2 \cdot O_2) = 4CO_2 + 6H_2O$. Exptl. values for CH_4 were 1 5 CO_2 and 3 H_2O; for C_2H_6, 3 CO_2 and 4.5 H_2O per ion pair, or 75% of the calcd. in each case The oxidation of C_3H_8 and C_4H_{10} is not complete in 1 step; liquid partial-oxidation products appear. Addn of CH_4 to CO_2 was shown, a caramel- or wax-like solid being deposited on the wall. In the oxidation of CH_4 by O_2, mixts with excess of either component gave approx. the same —M/N ratio as the stoichiometric mixt., showing the ions of both components to be equally effective in the chem reaction. Marie Farnsworth

The inhibition of the glow of phosphorus. H. J Emeléus. *J. Chem. Soc.* **1926**, 1336–44; cf. *C. A.* **20**, 149.—Rayleigh's method (*C. A* **19**, 21) of studying the influence of gases on the slow luminous oxidation of P is repeated in O_2-N_2 mixts and extended to H_2, CO_2 and the org. vapors of turpentine, C_2H_2, C_6H_6, $CHCl_3$, $PhNH_2$. The org. vapors are powerful inhibitors, for they stop the reaction and accompanying ionization phenomena in small concns. The case of O_2 is of special interest. P is oxidized more slowly in pure O_2 or when the partial pressure of O_2 is greater than the limiting value detd. by expt. The crit. glow pressure is a function of temp. These inhibiting agents lose their effectiveness when the temp. is raised to 90°. Any satisfactory mechanism of the inhibition must explain why an increase in temp. or a diminution in pressure tends to produce the glow. Howard R Moore

Luminescence of solids. J. Ewles. *Proc. Leeds Phil. Lit. Soc.* **1**, 6–10(1926). – A theoretical paper supporting the view that luminescence is due to an impurity present in solid soln , whose lattice dimensions vary with the character and amt. of impurity. X-ray analysis supports E.'s view that cathode luminescence is emitted by impurity as a sort of nucleus with a large no. of mols. clustered about. The min. speed of cathode rays for excitation is 60 v. for ZnO. Rate of decay of phosphorescence is related to an optimum concn. of impurity. H. R Moore

Excitation of fluorescence with the short-wave ultra-violet. Otto Oldenberg. *Z. Physik* **38**, 370–7(1926).– Fluorescence of N_2 and H_2 is caused by radiation of the gases with ultra-violet light of short wave length. The spectrum for N_2 shows the bands of both the neutral and the ionized mols. while the spectrum for H_2 gives only the line spectrum of the atom. J. H. Perry

Transmutation of mercury into gold. Arnaldo Piutti and Enrico Boggio-Lera. *Giorn. chim. ind. applicata* **8**, 59–61(1925).—The authors, using exptl. conditions differing from those used by others, confirm the negative results obtained by Tiede and others, as contrasted to the supposed discovery of Miethe, Stammreich and Nagaoka. It is possible, however, that the transmutation of Hg to Au takes place spontaneously and continuously in nature. Robert S. Posmontier

Remarks on the researches of Miethe, Stammreich and Nagaoka on the transmutation of mercury into gold. E. H. Riesenfeld and W. Haase. *Ber.* **59**, 1625–9 (1926).—The improbability for theoretical reasons of the transmutation of Hg into Au

is pointed out, especially considering the low amt. of energy involved in the methods of M., S. and N. The theory of transportation of Au atoms or AuHg mols by the Hg-vapor stream is upheld by calcg. according to Knudsen, Bennewitz and Volmer that in distg. 600 g. Hg from a surface 50 sq. cm. at 100° and 0.27 mm Hg, the speed of the Hg-stream is 1/3 of satn., where no particles return to the evapg. surface. M. and S. claim lately to have obtained an Au output proportional to the energy input (*C. A.* **20,** 1755) with an app. similar to the Boas Hg-interruptor. Expts. of this type were repeated and the Hg was analyzed according to the method given previously (cf. *C. A.* **20,** 1612) with the result that repeated expts. of long duration in the same apps. gave decreasing amts. of Au. A sketch of the distn. app. for analyzing Hg is given.
JOHN T. STERN

Rare earths. XXIV. A theory of color. L. F. YNTEMA. *J. Am. Chem. Soc.* **48,** 1598-1600(1926).—The presence of color in the rare earths and some common elements seems to be due to an incomplete atom kernel. Some relationships in position of absorption band for the rare earths are pointed out.
G. L. CLARK

4—ELECTROCHEMISTRY

COLIN G. FINK

A 100,000-ampere electric furnace at St. Julien de Maurienne. P. BERGEON. *Bull. Soc. Franç. Élec.* **6,** 75-80(1926); *Science Abstracts* **29B,** 221.—The furnace described is the largest single-electrode furnace in the world, for ferro-Mn and ferro-Si. CaC_2 requires 54 to 57 volts; ferro Mn 39 to 40; ferro-Si (25% Si) 55, ferro Si (45% Si) 50. 3450 tons of CaC_2 required 3250 kw.-hrs. per ton. The furnace can take up to 5000 kw., and will run normally with a current of 120,000 amps. The electrode is 2.5 meters in diameter and 1.2 meters in length, and is built up from eight segments of C arranged symmetrically around a central core of C. Each segment of this compound electrode is provided with its own current conductor, these being formed of cast steel and sealed in with copper. They are made hollow and are water cooled. In spite of the enormous size of the single electrode, there has been no difficulty in operating the furnace with the high-power factor of 0.953. The crucible or body of the furnace is constructed of reinforced concrete, and *is made perfectly air-tight by an interlining of Pb. In this way the designer has overcome the difficulties often caused by air-infiltration through the outer furnace-shell. The current conductors for the sole-plate are carried down the inside of the hearth,* parallel to the central conductor, instead of being connected directly to the base. The hearth has the form of a polygon-star, a channel being left in each of the eight points, through which the sandwiched conductors are passed up from the transformers. Each of these channels carries two bundles of conductors, and feeds two separate circuits of the furnace. The four transformers are placed in a chamber below the furnace, and are so arranged that the eight electrical circuits are quite symmetrical. The base and sides of the furnace are cooled by air, the central pillar which supports the hearth being provided with a central air channel through which a current of cold air is forced. This cools not only the whole understructure of the furnace, but also the chamber containing the transformers.
C. G. F.

Melting steel and gray iron with electric heat. ANON. *Elec. World* **88,** 709 (1926).—Duplicate charges of pig Fe were made up for the elec. furnace and for the cupola, resp., with the following result (gray iron castings): C 3.12, 3.28; Si 1.69, 1.63; Mn 0.611, 0.629; S 0.063, 0.073, P 0.56, 0.55%. The elec. furnace Fe showed no change in analysis, whereas the cupola Fe had a pick up in C and S due to the coke.
C. G. F.

Electric furnace for silico-manganese. C. C. *J. four élec.* **35,** 165(1926). Three new elec. furnaces for the production of silico-Mn were designed to use 1250 kw each. Each has 2 electrodes 35 × 35 cm. by 2 m. long, connected in series. A novel feature is the construction below floor level. Mechanical arrangements make it possible to change the electrodes in 13 to 15 min. Two electrodes were found to last 17 and 21 days; 40 kg. of electrodes were consumed per ton of Si-Mn (50-55% Mn and 20-25% Si) produced, with an expenditure of 5500 kw.-hrs. The cost of installation is low owing to the absence of a platform, charging equipment, lower height of the electrode supporting column, etc.
G. DUBPERNELL

Thermal insulation of electric furnaces. (A new fireclay refractory.) M. L. HARTMANN AND O. B. WESTMONT. *Trans. Am. Electrochem. Soc.* **50** (preprint), 25 pp. (1926).—The thermal conductivities of fused Al_2O_3, fused MgO, fireclay and a new high-temp. insulating fireclay (cf. *C. A.* **19,** 2870) refractory are given in addition to

the published data on carborundum and SiO_2. Mean specific heat curves for these refractories are also given. The temps., heat losses and heat capacities of 13 types of elec. furnace linings are tabulated, with the inside surface temps. assumed to be 1600°, 1400° and 1200°. The object of this paper is to suggest possibilities of energy conservation in elec. furnaces by properly designed composite walls. The data presented emphasize (1) the importance of considering the heat capacities of walls under specific temp. conditions, (2) the great value of refractory insulating materials in preventing heat losses without increasing the capacity of a furnace lining to absorb and store heat. Heretofore no material was available which would withstand the high temps. back of thin "super" refractory linings. In the past it has been necessary to use a thicker inner lining, with consequent greatly increased heat capacities and larger exterior furnace surface with increased radiation losses. With the introduction on the market of the new fireclay-refractory insulating material, which can be used up to 1450°, it is now possible to make relatively thin elec.-furnace linings without the heat losses usually caused by such practice. C. G. F.

An application of recrystallized silicon carbide (in porcelain kilns). F. A. J. FITZGERALD. *Trans. Am. Electrochem. Soc.* **50** (preprint) 6 pp (1926).—A refractory for certain elec. furnaces developed for the firing of porcelain at high temps. The elec. resistors in these furnaces are made of graphite, and are enclosed in gas-tight resistor chambers sepd. from the chambers in which the porcelain is fired by a septum which forms the floor of the resistor chamber and the roof of the firing chamber, through which the heat is conducted from the resistor chamber and thence radiated to the ware. This design is necessary because during the firing of the porcelain an oxidizing atm. is required, obviously an impossible condition with a graphite resistor in the same chamber. The firing temperature is high, in some of the work reaching at least 1570°. The specifications for the septum are: 1. High heat cond., so as to avoid an excessive difference of temp. between the resistor and firing chambers. 2. No softening of septum with consequent distortion when highly heated for long periods. 3. Resistance to deterioration when heated to a high temp. in the strongly reducing atm. of the resistor chamber. 4. Resistance to deterioration when heated to a high temp. in the strongly oxidizing atm. of the firing chamber. The refractory which proved most promising for this work was recrystd. SiC. Articles of recrystd. SiC are made by mixing with granular or powdered SiC a temporary bonding substance, such as glue, molding into the desired form and then heating in a furnace to a temp. equal to that at which silicon carbide is formed, approx. 1800°. C. G. F.

The electrical excitation of metal vapors in the King resistance furnace. H. SCHÜLER AND K. L. WOLF. *Z. Physik* **37**, 728–31 (1926).—The King resistance furnace (*C. A.* **2**, 3028) is modified so that elec. excited vapors of high melting metals may be observed. The metal is heated in a graphite tube to approx. 2000°, and the vapor at 0.2 mm. pressure is subjected to a glow discharge from an auxiliary circuit. Spectra thus obtained are similar to arc spectra but have a greater intensity. Since the elec. field is weak, an unusual sharpness results even at high dispersion. An app. is devised which facilitates the study of the energy of excitation of the single lines according to the method of Franck and Hertz (*C. A.* **13**, 2483). F. E. SNYDER

Electrolysis of the light metals. K. ARNDT. *Metall Erz* **23**, 302–6 (1926).—A discussion of present methods of producing *Al* and *Mg* in Europe and America. C. G. KING

Anodic formation of carbon tetrafluoride in the production of aluminum. W. D. TREADWELL AND A. KOHL. *Helvetica Chim. Acta* **9**, 681–91 (1926).—As little as 1% CF_4 in CO and 0.025% CF_4 in H_2 could be detected by burning the gas and observing etching of glass by the flame due to HF. In the electrolysis of cryolite in an electrically heated MgO crucible with an anodic c. d. of about 2 amps./sq. cm. no CF_4 could be detected in the anode gas, so that it must have been considerably under 1% of the CO_2 content of the gas, if any were formed at all. G. DUBPERNELL

Electrolysis of metals of cerium family and the preparation of pyrophoric alloy. MASAKICHI OHYA. *Repts. Imp. Ind. Research Inst., Osaka* (Japan) **7**, No. 4, 1–30 (1926).—To prepare anhyd. $CeCl_3$, for electrolytic purposes, passing dry HCl over a heated CeO_2 and C mixt., or CeO_2 heated in a current of CCl_4 is not satisfactory owing to the presence of impurities in the final product; heating CeO_2 in a current of $COCl_2$ produces a pure $CeCl_3$, but this method is not applicable to large scale production. The method of heating hydrated $CeCl_3$ in a current of dry HCl or in presence of NH_4Cl gives the best result. For simplicity of technic and purity of product, dehydration of $CeCl_3$ by NH_4Cl is recommended. A partition between the parallel poles of the electrolytic cell is used. The optimum temp. for electrolysis lies between 820° and 840° and the best composition of

the electrolyte mixture is made of 100 pts. of anhyd. $CeCl_3$ and 15 pts. of the mixture of NaCl and KCl in equimol. proportions. In an expt. in a MgO crucible and with an Fe rod as cathode a 33% yield of Ce metal at a current efficiency of 32% was obtained. O. made a pyrophoric alloy, "Kunheim metal," using an Fe mold and casting *in vacuo*.
NAO UYEI

Voltage studies in copper refining cells. COLIN G. FINK AND C. A. PHILIPPI. *Trans. Am. Electrochem. Soc* 50 (preprint), 6 pp (1926).—Anode and cathode polarization and *IR* drop through the Cu electrolyte were detd under varying conditions of temp. and composition of electrolyte Results indicate the importance of studying and controlling the voltage at both cathode and anode surfaces, and not merely considering the *IR* drop through the electrolyte, as has been common practice in the past, to arrive at the most efficient refining operating conditions. C. G. F.

The effect of superposed alternating current on the polarizable primary cell, zinc-sulfuric acid-carbon. II. High frequency current. A. J. ALLMAND AND H. C. COCKS. *Proc. Roy. Soc.* (London) **112A,** 252–8(1926).—A vacuum-tube oscillator was used to supply an a. c. of about 10,000 to 12,000 cycles with a current from 0.1 to 0 9 amp The effect of superposed a. c was studied on the cell e m. f and electrode potential. High-frequency currents have considerable depolarizing action on an amalgamated Zn anode in acid soln , as suggested by Brown (cf C A 8, 2102); hence this is the cause of increased current output in this cell. High-frequency currents have no effect on C. Depolarizing action of low-frequency currents on C electrodes is attributed to partial destruction of the H charge during an anodic pulse, which is not instant and is more marked with lower frequency R. W. RYAN

The polarization of zinc electrodes in neutral and acid solutions of zinc salts by direct and alternating currents. I. A. J. ALLMAND AND H. C. COCKS. *Proc. Roy. Soc* (London) **112A,** 259-79(1926); cf. preceding abstr —An amalgamated Zn electrode made anode in acid $ZnSO_4$ soln undergoes polarization which may be more than overcome by superposition of a sufficiently large a c of high frequency. The mechanism is obscure. A. and C. have investigated the effect of amalgamation in presence and absence of free H_2SO_4 and unamalgamated electrodes in neutral solns. A. c. frequencies from 50 to 11,000 cycles obtained from a vacuum-tube oscillator, d. c., and compd. currents were used Three identical Zn electrodes were used in soln , the middle electrode being polarized by compd current, one for d. c. and one for a c The potential of electrodes was measured by the *N* calomel electrode The observed polarization phenomena, in the case of unamalgamated electrodes, is due to retardations in actual electrode processes, which retardations are closely connected with charges of at. O and H in the electrode surface layers In the case of amalgamated Zn electrodes an at. H amalgam is postulated which will decompose to give H_2. This H is regarded as passive. ROGER W. RYAN

Graphic presentation of the relation between current efficiency, bath potential and energy consumption in technical electrolysis. R. NITZSCHMANN. *Chem.-Ztg.* **50,** 525(1926).—If E is the bath potential in volts, A the electrochemical equiv corresponding to amp.-hr. per unit of material produced, η the current efficiency in %, K the energy consumption in kw -hr per unit of material produced, then: $E = \eta K.1000/A$. This relation is graphically shown, and the principal equations for a few electrolytic processes are given. H. STOERTZ

Some properties of electrolytic iron. G. P. FULLER. *Trans. Am. Electrochem. Soc.* **50** (preprint), 6 pp (1926).—Electrolytic Fe tubes as manufd. at Niagara Falls contain C 0.006, S 0 004, Si 0 005, P 0 005, Cu 0 015, Mn 0.000, Fe by difference 99 965%. The S, Si and P are practically const. C and Cu are the principal variables, C due to conditions in the electrolyte. and Cu due to the impossibility of securing anodes and scrap Fe free of this element, or contg it in const. proportions. It is possible to reduce the Cu content to 0 004% but only at increased trouble and expense. The C content is the factor which chiefly influences the properties of the metal. The presence of Cu is ordinarily in no way detrimental, and may be beneficial in respect of its resistance to chem. corrosion, and also in improving the working properties of the metal. Electrolytic Fe, because of the virtual absence of carbon, can be annealed at a high temp. and instantly quenched in cold water without appreciable effect on its physical properties or structure. It is possible in working to take greater reductions per pass, and more passes between anneals, than is possible in the case of mild steel. This property, coupled with the ability to quench at once after annealing without hardening, makes the metal peculiarly adapted to cold working both in drawing and in deep stamping. In nonoxidizing solns. electrolytic iron is about three times as resistant to corrosion as dead soft steel, while in oxidizing media there is little, if any, difference between the two. C. G. F.

The present position of electrolytic zinc production. GEORG EGER. *Metall Erz* !3, 316(1926).—A discussion of the development, present status and probable developnent of electrolytic Zn production. C. G. KING

Acid zinc plating baths. M. R. THOMPSON. *Trans. Am. Electrochem. Soc.* **50**(preprint), 25 pp. (1926).—The throwing power of acid-Zn plating baths cannot be increased naterially, chiefly because of their low cathode polarization. Simple baths of much iigher cond than those commonly used can be prepd. in which satisfactory deposits :an be produced at unusually high c. ds. Such baths may contain a moderate concn. of $ZnCl_2$ (*e. g.*, 2 *N*); a high concn., *e. g.*, 3 to 4 *N* of NaCl or NH_4Cl and a small concn., *e. g*, 0.25 *N* of $AlCl_3$. These baths operate best at a p_H from 3.5 to 4.5. C. G. F.

Cadmium: its electrodeposition for rust-proofing purposes. C M. HOFF. *Trans. Am. Electrochem Soc.* **50**(preprint), 12 pp (1926).—Cd should be a better rust-protecting olate than Zn because it is less active chemically, but at the same time protects Fe electrochemically, forms a protective oxide film, is not amphoteric in character and although softer than Zn is more ductile. A soln. has been developed (U. S pats. 1,564-413 and 1,564,414; *C. A* **20,** 341) which will deposit Cd in a dense, ductile, adherent, bright orm over a wide range of current densities, is in equil with the anodes, is self-sustaining, has low resistance, high throwing power, and will accommodate high current densities Thin deposits of Cd effect comparatively great rust resistance; the time of deposition s short, which enables increased production to be obtained with plating equipment with owering of costs C. G. F.

Theory of the electrolytic separation of chromium from aqueous chromic acid solutions. ERICH MULLER. *Z. Elektrochem.* **32,** 399-413(1926).—A no. of c. d-cathode potential curves are plotted for cathodes of C, Pt and Hg (also Cu, Pd and Au) n solns. of specially purified CrO_3, and CrO_3 to which H_2SO_4 and Na_2SO_4 were added. The curves are explained and correlated on the basis of the assumption of a diaphragm or film of Cr_2O_3 or $Cr_2(CrO_4)_3$ on the cathode. No direct evidence could be found for he existence of such a diaphragm in the electrolysis of pure CrO_3 aside from the course of the current-voltage curves, but its existence is assumed and M. considers that this diaphragm prevents access of unreduced CrO_3 to the cathode and no reduction takes place In the presence of SO_4 ions the diaphragm is damaged and reduction takes place Other anions behave similarly, as was found by adding NaCl, $NaNO_3$, $NaClO_3$ and Na_2SiF_6 to pure CrO_3. H_3PO_4 has no effect, nor do CrO_4 ions have the effect of SO_4 ons, as was found by adding Na or Ca chromate. Pure CrO_3 gave only a blackish and powdery appearing deposit of Cr but a white and, under certain conditions, bright deposit was obtained when SO_4 and other anions were added. $Cr_2(SO_4)_3$ and H_2SO_4 in equiv. amts. have the same action as Na_2SO_4. Many details of theory are discussed. G. DUBPERNELL

Electrolysis of sodium chromate with the mercury cathode. I. SHCHERBAKOV AND O. ESSIN. *Z. Elektrochem.* **32,** 396-9(1926).—In comparison to the diaphragm method an increase in the yield of dichromate was found in the electrolysis of chromate solns. with the Hg cathode The yield increases with increasing c. d., with increasing concn., and with decreasing temp.; this corresponds to the theory of the cathodic overvoltage of H. A sharp increase in cond. was found at approx. 75% cation exhaustion, which corresponds to the formation of the polychromate, $Na_2Cr_4O_{13}$. The depolarizing action of the solns. at platinized Pt electrodes at diff. percentages of cation exhaustion increases in relation to the increasing cation exhaustion. Higher yields of dichromate are obtained with either higher c. d. in chromate solns. or lower c. d. in polychromate solns. G. DUBPERNELL

Economical design in the plating shop. R. C. MITCHELL. *Brass World* **22,** 259-60(1926).—A review of app. and equipment used in the shops of the Edison Storage Battery Co. for cleaning and Ni-plating steel parts and for the production of Ni metal n extremely thin flake form. *Monel metal* equipment is generally very durable. Trouble may be had with stainless steel owing to electrolytic action if it is in contact with other metals in a damp atm. G. DUBPERNELL

Galvanoplastic plating with nickel. B. C. SOYENKOFF. *Brass World* **22,** 261-2 (1926).—A review of Ni deposition and of a considerable no. of baths. $NiSO_4$ baths give higher polarization and better deposits than $NiCl_2$ baths. A content of Cl ion in the sulfate baths is desirable to prevent anode polarization. G. DUBPERNELL

The electrochemical reduction of indigo. JACOB NEVYAS AND ALEXANDER LOWY. *Trans. Am. Electrochem. Soc.* **50**(preprint), 12 pp (1926).—A quant. study has been made of the influence of variations in c. d., temp. and concn. of electrolyte upon the current efficiency of the electrochem reduction of indigo, in finely divided suspension in solns of NaOH with a Hg cathode. It is shown that the current efficiency (*a*) decreases with

increasing current density, (*b*) increases with increasing temp., and (*c*) increases with increasing concn. of alkali. An app. has been developed for studying electrochem. reductions, which permits of the electrolysis of a compd. and the withdrawal of a sample of catholyte in an O-free atm C. G. F.

The electrolytic oxidation of *p*-bromotoluene and of *o*-nitrotoluene. J. E. CONN WITH ALEXANDER LOWY. *Trans. Am. Electrochem Soc.* **50**(preprint), 12 pp.(1926).—*p*-Bromotoluene and *o*-nitrotoluene were subjected to electrolytic oxidation in dil. HNO_3 soln , of such a concn as would bring about only slight chem. oxidation. *p*-Bromotoluene was converted to *p*-bromobenzoic acid with excellent yields. The favorable conditions are: (*a*) an electrolyte of 20% HNO_3; (*b*) Pt electrode; (*c*) vigorous stirring; (*d*) a c. d of 0 50 amp. per sq. dm ; and (*e*) temp. of 100°. *o*-Nitrotoluene was converted to *o*-nitrobenzoic acid in low yields A resinous material, oxalic acid and CO_2 were the other products formed on oxidation No solvents were used C G F.

Electrochemical chlorination and bromination of benzene. C. W. CROCO WITH ALEXANDER LOWY. *Trans. Am. Electrochem Soc.* **50**(preprint), 12 pp (1926).—It is possible to chlorinate benzene by stirring it with concd. HCl and electrolyzing. The main product is chlorobenzene. This investigation showed that the amt. of chlorobenzene was the same in both the electrolytic and the non-electrolytic expts The electrolytic method, however, gave a small amt of more highly chlorinated products which were not found with the non-electrolytic method. Therefore, it is concluded that the principal action of the Cl generated electrolytically was electrochemical in nature, along with a slight amt of electrolytic action. In bromination, the electrolytic and non-electrolytic expts produced bromobenzene in about equal amts , and this was the only product observed. This reaction is an electrochemical one. C. G. F.

Weight efficiency of storage batteries. SAKAE MAKIO. *Elec. World* **88,** 433 (1926).—Curves show the wt efficiencies (kg /kw -hr.) of various types of batteries with varying capacity, and for different uses It is concluded that the mean "weight energy" ratio for portable batteries may be taken as 50 at the normal 5-hr. discharge rate and as 100 for stationary batteries at a 10-hr discharge rate G. D.

Comparison of storage-battery separators made from different kinds of wood. C. WOODBURN *Trans Roy. Soc. Can* **18,** III, 123-4(1924). —Eight species of wood have been tested with a view to obtain data regarding their resp efficiencies as storage-battery separators, and the results are tabulated B C. A.

Mechanism of breakdown of dielectrics. P L. HOOVER. *J. Am. Inst. Elec. Eng.* **45,** 824(1926) —The fundamental concept is that there is a kinetic equil between the mobile charges and the mols If there is any appreciable heating effect due to the conduction current or to dielec losses the equil conditions will be changed and, therefore, the thermal effect must be considered. If the field is not uniform or if the dielec. is composite or heterogeneous, there is the possibility that part of the insulation will be overstrained and internal discharges are then likely to initiate high-frequency effects that disturb the stability of the dielec. as a whole All 3 of these effects, mechanical, elec and thermal, are undoubtedly present in every breakdown, but in many cases one, or even two of them may be negligible They are not 3 sep. effects, but 3 manifestations of essentially the one phenomenon of kinetic equil. between the ions and the mols. of the dielectric. G. DUBPERNELL

Passivity and corrosion of iron (MCCULLOCH) **9.** Semi-coke (Brit. pat. 241,262) **21.**

Storage battery. A. CELLINO. Brit. 241,898, Oct. 22, 1924. A positive electrode of the usual Pb oxide type is used with a negative electrode which becomes coated with Zn, Al or other metal deposited from the electrolyte when the battery is charged. The electrolyte is made by passing a current between Pb and Al plates in a soln. of Na silicate, adding H_2SO_4 and then sulfate of Zn or other metal. The $ZnSO_4$ may be produced in the soln. by replacing the Pb plate by a Zn plate Other features also are described.

Storage battery. C. A. WEBSTER. U S. 1,600,083, Sept. 14. Structural features.

Storage battery. R B. OWEN. U. S. 1,599,836, Sept. 14. Structural features.

Storage battery. C. J. DUNZWEILER. U. S. 1,598,123, Aug. 31. Structural features.

Storage battery. O. W. A. OETTING. U. S 1,598,218, Aug. 31.

Storage battery. T. A. WILLARD. U. S. 1,600,442, Sept. 21. Structural features.

Dry battery. R. OPPENHEIM. U. S. 1,599,061, Sept. 7. Positive and negative electrodes are assocd. with an intimate mixt. of wood charcoal or other porous powd. depolarizing material and immobilizing colloidal pectizable material such as flour paste contg. the electrolyte.

Dry cell electric battery. A. T. BALDWIN. U. S. 1,598,111, Aug. 31. Structural features.

•**Electric batteries.** L. DARIMONT. Brit. 241,729, Nov. 14, 1924. The porous jar of a 2-fluid cell is provided with a substance (*e. g.*, $CaCO_3$ which may be mixed with cement or plaster, asbestos, pumice or the like and spread as a layer over the interior of the porous jar) which will react with Fe chloride or sulfate in the depolarizing soln. or with $ZnCl_2$ in the exciting soln. to form a semi-permeable diaphragm of Fe hydrate or $ZnCO_3$ Cf. *C A*. **20,** 21.

Metal electrodes for batteries. G. W. HEISE. U. S. 1,598,683, Sept. 7. Amalgamated metal electrodes are roughened by chem. treatment, *e g*, by successive treatments with HNO_3 and an alk. sulfide, to provide a surface which will retain a coating of pitch, rubber cement or like substances

Depolarizing agent for electric batteries. T. A. EDISON. U S. 1,599,121, Sept 7. $Cu(OH)_2$ is formed, *e. g.*, by treating $CuSO_4$ and $MgSO_4$ with NaOH, so that it is combined with alk. earth hydroxide upon its formation.

Ion-concentration cell. H. C. PARKER U. S. 1,599,483, Sept 14.

Electrolytic cells adapted for producing hydrogen and oxygen. F. LAWACZECK. U. S 1,600,478, Sept. 21.

Electric device for indicating liquid levels at a distance. G. E. HENDERSON. U. S reissue 16,417, Sept. 7.

Electrolyte for rectifiers. C. C. CARPENTER. U. S 1,600,397, Sept. 21. Salts such as NH_4 and K phosphates and citric acid are used in aq. soln with Al electrodes.

Electric resistance furnace. A. D. KEENE. U. S. 1,597,900, Aug. 31.

Electric induction furnaces. C. A. BRAYTON, JR. U S. 1,598,236, Aug. 31.

Electric induction furnace. C. A. BRAYTON, JR. U S 1,599,161, Sept. 7.

Electric resistance furnace. BRITISH THOMSON-HOUSTON CO, LTD. Brit. 241,897, Oct. 23, 1924.

Resistance-heated electric crucible furnace. W. E. PRYTHERCH. Brit. 241,256, Apr. 3, 1925.

Reinforced carbon electrodes for electric furnaces. C W. BECKER. Brit. 241,461, Apr. 15, 1925.

Electrode and circuit breaker for electric furnaces. RHEINISCHE METALLWAAREN UND MASCHINENFABRIK. Brit. 241,865, Oct. 22, 1921.

Nitric acid. C SPATH. Brit 241,413, Dec. 10, 1924. H_2O or other liquid yielding H and O on dissocn. is introduced into the elec. arc in fixation of atm. N. Cu, Cd or their alloys may be used as catalytic electrode materials

Earth metal manufacture. H. DOLTER. Can. 259,715, Apr. 13, 1926. In the electrolytic manuf. of earth metals, the electrolyte is melted within the electrolytic tank and is maintained in a liquid state by means of flameless combustion gas radiators immersed within the electrolyte; the elec. current is used solely to decompose the already melted electrolyte.

Acetaldehyde from acetylene. N. GRUNSTEIN and P. BERGE Can. 262,271, June 29, 1926. The process extends the catalytic activity of Hg compds. to the process of forming additive C_2H_2 compds. It consists in passing a current of C_2H_2 through an acid bath which contains a Hg compd. as a catalyzer to produce absorption of C_2H_2, oxidizing the metallic Hg forming by means of an elec current to regenerate the catalyzer, placing the cathode in a porous compartment and removing the H_2.

Zinc produced electrothermically. F. THARALDSEN. U. S. 1,598,176, Aug. 31. In producing Zn in an elec. resistance furnace, an even layer of coke and a correspondingly even layer of ZnO charge are simultaneously introduced into the furnace chamber and the charge is subjected to elec. heating by supplying current to the coke, and continuously discharged.

Electrochemical treatment of copper ores. H. S. MACKAY. U. S. 1,598,296, Aug. 31. Cu sulfide ores, concentrates or residues are roasted to render the Cu sol., the product is leached with H_2SO_4 to ext. the Cu, the $CuSO_4$ soln. is purified of Fe, Al and the like and acids and bases in the soln. are regulated and controlled, *e g.*, by adding $CaCO_3$, filtering and, later, adding free acid, and the soln. is then electrolyzed to deposit Cu and regenerate H_2SO_4.

Electrodeposition of metallic chromium. E. SUZUKI. U. S. 1,600,076, Sept. 14. A Pb anode is used in an electrolyte contg. in soln. chromic acid 5–10, Cr sulfate 5-15 and H_3BO_3 5%.

Electrodeposition of tin. H. R. MCILHENNEY. U. S. 1,598,295, Aug. 31. Sn is supplied to the electrolyte by adding to it a Sn compd. (such as may be formed from

Na stannate with an acid or acid salt) which is substantially insol. in H_2O but sol. in the products of electrolysis formed as the electrodeposition proceeds.

Electrolytic decomposition of chlorides. E. SCHLUMBERGER. U. S. 1,598,018, Aug. 31. C or graphite anodes are used and the electrolyte, *e. g.*, NaCl soln for the production of Cl and NaOH, is introduced through pores of the anodes.

Electrolytic purification of graphite. L. C HAFFNER U. S. 1,600,730, Sept. 21. Graphite is electrolyzed while in suspension in a soln such as a dil. aq. HCl soln.

Electrolytic cleaning of ferrous metals. I. H LEE U. S. 1,598,731, Sept. 7. An electrolyte for cleaning ferrous metals comprises an aq soln. of Na citrate or tartrate or other alkali metal salt of an org. reducing acid which has been made slightly alk. in reaction.

Cleansing ferrous metals. S. OTIS and W. T. HERRON. U. S. 1,600,355, Sept. 21. Steel pipes which are to be coated with Pb (or other ferrous articles) are immersed in a bath contg. NaOH and electrolyzed

Forming copper plates, strips, bars, etc., by progressive electrodeposition. C. K. TOPPING. U S 1,600,257, Sept 21.

Electrolytic apparatus for decomposing metallic salt solutions. H. P. EWELL. U S. 1,599,701, Sept 14. An app. adapted for the production of Na amalgam by the decompn. of NaCl comprises a tank through which Hg may be circulated with a countercurrent circulation of a soln. of NaCl or other metallic salt which is electrolyzed within the tank

Apparatus for electrical precipitation of suspended particles from gases. C. H. WEISKOPF. U. S 1,600,496, Sept. 21.

Catalysts. TECHNICAL RESEARCH WORKS, LTD, AND E. J. LUSH. Brit. 241,278, July 16, 1924 The process of Brit 203,218 (*C. A*. **18**, 502) for activation and reactivation of metallic catalysts by electrolytic anodic oxidation and subsequent reduction is applied to the treatment of Ni Cu alloys or other alloys The reduction of the electrolytically oxidized surface of the metal may be effected without previous removal of the alkali metal salt employed as electrolyte

Mounting for diamonds (comprising electrodeposited metal in a state of tension). T. A. EDISON U S 1,600,722, Sept. 21.

Electroplating. J. R. BROWN and J. C MULLINNIX. U. S 1,599,608, Sept 14 Hollow molded wood pulp floats or other articles are first coated with celluloid or a similar cellulose deriv, then coated with bronze or Cu powder or other electroconductive material, and electroplated with a metal, *e. g*, Cu.

Electroplating apparatus. C. G. MILLER U. S 1,597,862, Aug 31.

Anode holder for electroplating cells. C. H. PROCTOR. U. S. 1,599,284, Sept. 7.

Incandescent lamp. P. A. CAMPBELL. U. S 1,600,203, Sept. 14. An incandescent lamp is formed with incandescing material of W or other non-carbonaceous substance on the surface of which there is applied a coating of solid carbonaceous material such as a deposit from "Aquadag" to prevent discoloration of the bulb during the early part of the life of the lamp but insufficient in quantity materially to change the phys. properties of the incandescing material.

Tungsten arc lamp. M. PIRANI. U. S. 1,600,843, Sept. 21. The bulb of an arc lamp is filled with one of the rare gases such as A at sufficiently low pressure to permit formation of an arc between the terminals at a comparatively low voltage and Hg is placed in the bulb for providing a higher vapor pressure during the operation of the lamp

Electric ozone generator. H. B. HARTMAN. Brit. 241,326, Aug. 6, 1924.

5—PHOTOGRAPHY

C. E. K. MEES

Conditions for the elimination of error in photographic spectrophotometry. H. M. KELLNER. *Z. wiss Phot.* **24**, 79-84(1926).—A mathematical investigation of the errors involved by the failure of the reciprocity law and of the intermittent integration of exposure in photographic spectrophotometry. In order to eliminate these errors, the comparison beam must be diminished to approx. the same extent as the beam to be measured by a method not involving intermittent exposure. C. E. K. M.

The projection and reproduction of screen plate photographs. RODOLPE BERTHON. *Compt. rend* **183**, 280 2(1926).—When screen plate pictures made by means of three-color unit screens are duplicated or printed, the colors are degraded because of overlap-

ping of the elements If the units are in the form of parallel lines, satisfactory results in duplicating can be obtained by projecting them by means of a special projecting lens divided into 3 sections. One section is left clear and the other two are provided with prisms of very small angles in opposite directions so that each unit line is projected on the image of the line next to it, and thus each line in the reproduction has the images of 3 adjacent lines superposed upon it. This system can be used also when instead of a color screen a microscopic refracting system is used for the production of the color images.
C. E. K. M.

Photographic action of rays emitted by Po (Bosch) **3.**

Photographic material. S. E. Sheppard Can. 259,182, Mar 23, 1926 A photographic developing-out emulsion comprises gelatin, a suspension of particles of Ag halide and an added compd upon which at least part of the light sensitiveness of the emulsion depends; the said compd contains a bivalent atom of the S group directly joined by a double bond to a single C atom to which at least another group of atoms is attached.

Photographic material. S E. Sheppard. Can. 259,184, Mar 23, 1926. A photographic developing out emulsion comprises gelatin, particles of Ag halide suspended therein and allyl tellurourea upon which at least part of the light sensitiveness of the emulsion depends.

Photographic material. S. E Sheppard. Can. 259,185, Mar 23, 1926 A photographic developing-out emulsion comprises gelatin, particles of Ag halide suspended therein and allyl selenourea upon which at least part of the light sensitiveness of the emulsion depends.

Photographic sensitizing materials. R. F. Punnett U S. 1,600,736, Sept. 21 A material for increasing the light sensitiveness of photographic gelatino-Ag-halide emulsions is prepd. from gelatin by soaking in H_2O contg. a small quantity of PhOH at a temp. of about 30°.

Photographic sensitizing material. S E. Sheppard. Can. 259,183, Mar 23, 1926. A photographic sensitizing material in concd form comprises a sterol-contg. fraction of a biochem. ext, the said fraction being in soln. in an org. solvent.

Photographic film. M de' Sperati U. S. 1,597,727, Aug. 31. A celluloid support or the like is coated on one side with a sensitive layer and on the other side with a layer of translucent material such as a gelatin and starch mixt. which has a ground-like surface capable of receiving retouches.

Photographic reversal process. J. G Capstaff. U. S 1,600,797, Sept. 21. An acid bath for use in a photographic reversal process for bleaching a Ag image preparatory to redevelopment is conditioned by adding to it a Ag salt such as $AgNO_3$ corresponding to the acid of the bath. The $AgNO_3$ is converted into Ag_2SO_4 by H_2SO_4 in the bath Cf. *C. A.* **20,** 343.

Photographic developer. K. Binder. Can, 262,287, July 6, 1926. An alkali is added to an aq. soln. of "tripyrocatechin-ferri acid potash."

Film for photocollographic printing plates. M. de' Sperati. U. S. 1,598,061, Aug. 31. A plate support such as celluloid carries a layer of gelatin on each side, one of which dissolves at a lower temp. than the other so that formation of pressure-equalizing relief portions is facilitated.

Multi-color photography. H. Piloty. U. S 1,597,818, Aug. 31. Optical features.

Silver halide emulsion. J. Reitstotter. Can 259,966, Apr. 20, 1926. Light-sensitive Ag halide emulsions are manufactured in the presence of benzothiazole compds.

6—INORGANIC CHEMISTRY

A. R. MIDDLETON

Structure of maganous oxide. C. Fontana. *Gazz. chim. ital.* **56,** 396-7(1926).—By means of a Cu anticathode Levi has recently shown (*C. A.* **19,** 424) that MnO is similar to NaCl in cryst. structure. Repeating the expts. with a Cr anticathode, with which far better results can be obtained, the earlier data of Levi were confirmed in all respects.
C C. Davis

Oxides and hydroxides of cobalt. Crystalline structure of cobaltous oxide and cobaltous hydroxide. G. Natta and A. Reina. *Atti accad. Lincei* [6] **4,** 48-54

(1926).—Because of the disputed existence of different oxides of Ni and of Co and of tervalent and quadrivalent Ni and Co, a general study of the problem was begun. In this first work the cryst structures of CoO and of $Co(OH)_2$, previously unknown, were detd CoO belongs to the monometric system and has an elementary cell with a = 4 22 A U. of the NaCl type, contg. 4 mols. Calcns. show the Co ion has an atomic diam of 2.92 A U. $Co(OH)_2$, prepd. both in cryst form by the method of DeSchulten (*Compt. rend.* **109,** 266(1889)) and as a ppt, showed a uniaxial rhombohedric structure The elementary cell, of the brucite type, contains 1 mol, is defined by the coordinates of the Co and O atoms: Co (0,0,0); O ($^1/_3$,$^2/_3$ u), ($^2/_3$,$^1/_3$,—u) and differs little from the cell of $Ni(OH)_2$, with which $Co(OH)_2$ was shown to be isomorphous. The structure, therefore, differs from that described by DeSchulten (*loc. cit.*). The calcd. d of CoO was 6 62, which was the identical value found by expt with the same sample, but which differs widely from earlier detns (*Chem Soc. Mem.* **2,** 401(1845), *Compt rend* **115,** 155(1892)) The calcd. d. of $Co(OH)_2$ is 3.75. C C Davis

Oxides of palladium. G R Levi and C Fontana. *Gazz chim. ital* **56,** 388 96 (1926).—A röntgenographic study of the oxides of Pd was made to establish definitely the existence or non existence of the various oxides, *viz*, Pd_2O, PdO, Pd_5O_6, Pd_2O_3 and PdO_2, recorded in the literature The study was confined to prepns supposed to be Pd_2O, PdO and PdO_2, resp, since the existence of Pd_5O_6 and Pd_2O_3 was considered highly improbable. Pd_2O, prepd by heating finely divided Pd to red heat in an elec furnace and cooling in air, and the existence of which has been in dispute (cf *Ber* **15,** 2225 (1882); **25,** 220(1892); *Z. anorg. Chem* **46,** 321(1905)), was shown to be non-existent, the product being a mixt. of Pd and PdO. PdO, prepd. by the method of Adams and Shriner (*C. A.* **18,** 2505), had d_4^{20} 8.70, and its lattice had a tetragonal symmetry of the NaCl type, with a = 4 23 A U, c = 5 20 A. U, with axial ratio of 1 23, and a calcd. d of 8 73. $PdO_2\ xH_2O$, prepd by pptn. from K chloropalladate and excess KOH (cf *Z. anorg. Chem.* **57,** 398(1908)), had a compn close to $PdO_2\ H_2O$, but failed to give a Rontgen spectrum. C C Davis

The oxides of chromium. Arthur Simon and Theodor Schmidt. *Z. anorg allgem. Chem.* **153,** 191-218(1926)—A study of the relative stabilities of the oxides of Cr by an examn. of the decompn diagrams at const. pressure. When CrO_3 is heated, it passes to Cr_5O_{13} from 260° to 285°, thence to Cr_5O_{12} from 360° to 366° and thence to Cr_2O_3 at 410° The 2 intermediate oxides are shown to be chromic chromates and decompose as follows: Higher oxide $\longrightarrow$ lower oxide + CrO_3; $CrO_3 \longrightarrow$ lower oxide + O_2. CrO_2 and Cr_8O_{10} are both less stable than Cr_5O_{12} and hence cannot be prepd by heating Cr_5O_{12}. This explains why they do not occur in the above series. The magnetic oxide, Cr_5O_9, was examd. by its decompn. curve and found to be more stable than Cr_5O_{12} In all cases the solid phases were identified or confirmed by Debye x ray photographs R E Gibson

Studies on carbon suboxide. Otto Diels *Z. angew. Chem.* **39,** 1025–8(1926).—A review of the methods of prepn, properties and structure of C_3O_2 Of the 2 suggested formulas, O=C=C=C=O and C=C—O, the former is probably correct.
└—CO—┘
E. H. Volwiler

Copper hydride and its crystal structure. Heinz Muller and A. J. Bradley *J. Chem. Soc.* **1926,** 1669-73—CuH was prepd by the interaction of H_3PO_2 and $CuSO_4$ Under certain conditions 25% of CuH can be formed at the cathode by electrolysis of 0 05-0 01 N $CuSO_4$ solns The crystal structure may be considered as hexagonal close-packed, axial ratio 1.59 to 1.60, the side of a unit rhomb being 2 89 A U. By obtaining one electron from H the substance assumes the hexagonal symmetry of Zn, the side of the elementary hexagon of which (a = 2.67 A. U) is slightly smaller than that of CuH. The space occupied by one H atom is nearly the same as that corresponding to the lattice expansion of Pd-H alloys M. and B. believe that the substance described as CuH_2 by Bartlett and Merrill (*Am. Chem. J.* **17,** 185(1895)) is a mixt. of Cu and Cu_2O. M O Lamar

The volatility and dissociation of borax. H. V. A. Briscoe and P. L. Robinson. *Nature* **118,** 374(1926).—Contrary to Kolthoff's observations (*C A.* **20,** 2129), evidence is presented to show that fused borax loses Na_2O. J. E. Snyder

Researches on residual affinity and coördination. XXVII. Ethylenediammine copper salts. G. T. Morgan and F. H. Burstall. *J. Chem. Soc.* **1926,** 2018-27; cf. *C. A.* **20,** 2465.—In their study of the stabilizing effect of ethylene-diammine on cupric iodide and cyanide the authors have prepd. and described the following compds: *Bisaquobisethylenediamminocupric iodide* (I), $[2H_2O.Cu.2en]I_2$, purple prismatic crystals, extremely sol. in H_2O, sparingly sol. in MeOH and insol. in Et_2O, Me_2CO, C_6H_6 and $CHCl_3$, m. 240° (decompn.); *monoaquobisethylenediamminocupric iodide* (II), $[H_2O.Cu.$-

2en]I_2, formed from I by dehydration over H_2SO_4 is lilac colored and has the chem. reactions of I; upon addn. of an excess of MeOH to a concd soln of I purple glistening leaflets of *methanolbisethylenediamminocupric iodide*, [CH_3OH.Cu.2en]I_2 are pptd. which are very sol. in H_2O, sparingly sol. in MeOH and EtOH and insol in non-hydroxylic solvents; *monoaquobisethylenediamminocupric cuprocyanide*, [Cu.2en.H_2O][$Cu(CN)_2$]$_2$, pale mauve or dark purple crystals which on heating to 110° change to the brown *bisethylenediamminocupric cuprocyanide*, [Cu 2en][$Cu(CN)_2$]$_2$, m. 210 240° (decompn); *bisethylenediamminocupric dicuprocyanide*, [Cu 2en][$Cu_2(CN)_3$]$_2$, pink crystals which m. 240° (decompn); *monoaquobisethylenediamminodicupric cuprocyanide*, [en Cu. OH_2 - Cu. en][$Cu(CN)_3$]$_2$, bluish green crystals; the *compd*. $C_{25}H_{80}O_6N_{24}Cu_5$, saxe-blue crystals, which slowly absorbed CO_2 from the air, and which were readily sol in H_2O, and alc. but not in $CHCl_3$, Et_2O or C_6H_6, m. 125° to blue liquid; *ethylenediammonium tricuprocyanide hemihydrate* (III), $C_{14}H_{22}ON_{14}Cu_6$, glistening plates, stable in air but decompd. by H_2O, yielding CuCN, insol. in all org. media; *ethylenediammonium cuprochloride*, colorless plates, rapidly oxidized in air in the presence of moisture, decompd at 210°; *ethylenediammonium cuprobromide*, $C_2H_{10}N_2Br_4Cu_2$, colorless lamella more stable than the chloride, m. 235° with blackening; *tetra-aquoethylenediamminocupric perchlorate*, [Cu en, $4H_2O$][ClO_4]$_2$, bluish violet needles, slightly hygroscopic, sol. in H_2O but insol. in alc. and other org solvents, explodes when heated with O or CuO and N, *bismethanolbisethylenediamminocupric cyanate tetrahydrate*, [Cu 2en $2CH_3$ OH]$(CNO)_2$ $4H_2O$, acicular crystals. This investigation furnishes further evidence on the point that 5 should be the characteristic coördination no of bivalent Cu (cf C A. **20**, 2465) E. R S

Residual affinity and coördination. XXVIII. Thermal measurements on derivatives of cupric iodide. G T MORGAN, S R. CARTER AND W. F HARRISON. *J. Chem. Soc.* **1926**, 2027 30(1926), cf preceding abstr.—*Ethanolbisethylenediamminocupric iodide*, [Cu 2en EtOH]I_2, dark bluish purple glistening plates, was prepd. by passing air through a suspension of CuI in H_2O at 60°, concg , cooling and treating with EtOH It decomposes slightly in air, darkens at 100° and m 235°, is extremely sol in H_2O and little in org. solvents Its heat of dissocn. on dissolving 3 g. in 200 cc. H_2O and adding 200 cc. of *N* HCl was detd. (+24 96 cal) and from this a reaction heat of +55 28 cal calcd for CuI +$2C_2H_4N_2H_4$ [Cu.2en.H_2O]I_2 gives +53 78 and [Cu.2en.-$2H_2O$]I_2 +55 55 cal. JOHN T STERN

Basic copper sulfates. GEORGE FOWLES *J. Chem Soc.* **1926**, 1845–58.—Basic Cu sulfates were prepd by (1) hydrolysis, (2) the action between $Cu(OH)_2$ and a soln. of $CuSO_4$, (3) the action between CuO and $CuSO_4$ and (4) that between $CuSO_4$ and a sol. base. The definite compds. are: (1) $CuSO_4$ $2Cu(OH)_2$, antlerite, pale, bluish green, microcryst , insol and stable in H_2O, stable in hot strong solns of $CuSO_4$; (2) $CuSO_4$.-$3Cu(OH)_2$, brochantite, pale green (bluish green when hydrated), microcryst., insol. and stable in H_2O, changes to (1) in hot strong solns of $CuSO_4$; (3) $5CuSO_4$ $9Cu(OH)_2$ - $2H_2O$, pale bluish green, microcryst , insol and stable in H_2O, changes to (1) in hot strong solns of $CuSO_4$; (4) $2CuSO_4$ $Cu(OH)_2$ $4H_2O$, *a new compd.*, pale emerald-green, cryst , decomposed by H_2O yielding (1), (2) and $CuSO_4$, exists only in solns satd. or nearly so, at the boiling temp ; (5) $2CuSO_4$ $3Cu(OH)_2$, pale blue, decomposes like (4) with H_2O and is stable in strong cold solns. of $CuSO_4$. F. disagrees with Bell and Murphy (*C. A.* **20**, 2294 5) and believes that in their expts equil. never was attained. M. O. L.

The double sulfates of metals of the rare earths and alkaline earths. FERRUCCIO ZAMBONINI AND S. RESTAINO. *Atti accad Lincei* [6] **4**, 5 10(1926) —In continuation of previous work (*C. A*, **20**, 879, 2960) the system $Ce_2(SO_4)_3$-K_2SO_4-H_2O at 25° was studied, a system for which data have been published by earlier investigators, but with discordant results The method already described (*C. A.* **19**, 2309) was utilized for establishing the existence of the individual double salts By this means were identified the following *compds :* $Ce_2(SO_4)_3$ $5K_2SO_4$ (I), $Ce_2(SO_4)_3$ 4 $5K_2SO_4$ (II), $2Ce_2(SO_4)_3$.-$3K_2SO_4$ $8H_2O$ (III) and $Ce_2(SO_4)_3$.K_2SO_4 $2H_2O$ (IV). I was also found only by Czundnowicz (*J. prakt. Chem.* **80**, 22(1860)) and by Barre (*C. A* **5**, 435), while only Barre prepd. II and IV. III had not been reported previously, though it was found by Z. and R. to have next to the widest field of existence. On the other hand $Ce_2(SO_4)_3$ $3K_2SO_4$, reported by Hermann (*J. prakt. Chem.* **30**, 186(1843)), by Joliu (*Bull soc. chim.* [2] **21**, 533) and by Czudnowicz, could not be obtained by Z., under any conditions, probably because the Cu used by the earlier workers contained La and Nd. I was composed of very small birefringent (unidentified) crystals, stable in solns. contg. approx. 5–9% K_2SO_4; II of minute birefringent crystals without sharp contour and stable in solns. contg. approx. 1.2–5.0% K_2SO_4. III was a white cryst. powder, stable in solns. contg. approx. 0.15–1% $Ce_2(SO_4)_3$ and in those contg. 0.2–1.0% K_2SO_4. It is also obtained in cryst. form by evapg. a soln. of the 2 sulfates in equimol. proportions. It is

isomorphic with the corresponding Nd salt (*C. A.* 19, 2309). IV was composed of minute elongated crystals, with optical extinction parallel to the direction of elongations, stable in solns. contg. 4.9–6.7% $Ce_2(SO_4)_3$ and traces (0.04–0.07%) of K_2SO_4. Crystals contg. 4.99% H_2O (theoretical 4.62%) lost 0.12% at 130° and 3.51% at 200° (calcd. for 1.5 H_2O = 3.54%). C. C. DAVIS

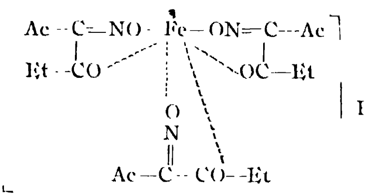
Thiocarbonates of the heavy metals and of the alkaline earths. WILHELM MANG. *Kunstseide* (Dec., 1925); *Rev. gén. mat. plastiques* 2, 357–61(1926).—Pptn of aq. solns of Na_2CS_3 gives, with $Pb(OAc)_2$, a cinnabar-red ppt ; with Fe_2Cl_6, brown; with $AgNO_3$, chocolate; with $CuSO_4$, dark brown; with $SnCl_4$, brown; with $BaCl_2$, yellow. Identification of the ppts. is complicated by the presence of polysulfides in the Na_2CS_3 soln., which do not react with CS_2 when prepg. the Na_2CS_3 and are pptd. as metallic sulfides. The ppts. are also very sensitive to the action of heat. On heating $PbCS_3$ decomposes into PbS and CS_2, both of which were identified. On progressive addn. of Fe_2Cl_6 to Na_2CS_3 soln. there is first pptd black Fe_2S_3, and then blackish brown *ferric thiocarbonate*, which on adding excess of Fe_2Cl_6 dissolves to a dark red soln which on heating ppts. out hydrated Fe_2O_3. The brown ppt of ferric thiocarbonate hydrolyzes when heated in the presence of H_2O, with formation of hydrated Fe_2O_3, or even when drying the moist ppt. On heating the dry ppt. with access of air it ignites with evolution of SO_2 and leaves a residue of Fe_2O_3; in absence of air S sublimes, but no CS_2 is evolved *Cupric thiocarbonate* behaves in the same manner as the ferric salt *Ba thiocarbonate* was prepd by adding CS_2 to a soln. of $Ba(OH)_2$ which was satd at 50° and heating on the water bath below the b. p. of CS_2 until no $Ba(OH)_2$ crystd. out on cooling On evapg almost to dryness and cooling there seps. a mixt of crystals of $Ba(OH)_2$ and (presumably) $BaCS_3$, as large yellow double hexagonal pyramids. The latter are pptd. with alc., and are sol in hot water to a dark orange soln, which gives the characteristic reactions of Na_2CS_3 soln. on addn of $Pb(OAc)_2$, Fe_2Cl_6 and $CuSO_4$, but without interference of polysulfides. On heating, $BaCS_3$ decomposes to BaO and S A P C

Studies of equilibria in systems of the type lead halide potassium halide water. L. J BURRAGE. *J. Chem. Soc.* 1926, 1703–9 This is an investigation of those complex salts formed by Pb halides and K halides which can exist in contact with aq solns The method employed was to vary the concn from 0 to satn of each of the component salts in turn in presence of excess of the other Equil existing at 25° in the system $KX \cdot PbX_2 \cdot H_2O$ (X = Cl, Br or I) were investigated over the whole range of concns At this temp. the following double salts can exist: $KCl.2PbCl_2$; $KCl.PbCl_2.{}^1/_3H_2O$; $KBr.2PbBr_2$; $KBr.PbBr_2.{}^1/_3H_2O$ and $KI.PbI_2.2H_2O$. Some of the compds whose existence is thus discredited are discussed. M O. LAMAR

The equilibrium between oxygen and metallic chlorides. K. JELLINEK AND A. RUDAT. *Z. anorg. allgem Chem* 155, 73–83(1926) —A stream of O at varying velocity and temp. was passed over the chloride, and the constitution of the resulting gaseous and solid phases detd. analytically between 300° and 600° The flow of gas was measured by means of a capillary flow meter, and the Cl liberated was absorbed in KI, the I liberated being titrated with $Na_2S_2O_3$ The compn of the solid phase was detd by the usual analytical methods. The reaction between $CuCl_2$ and O_2 was studied between 300° and 450°, and for each velocity of O flow used the % Cl by vol liberated was detd and extrapolated to zero velocity of O flow For const temp and velocity of O, the partial pressure of Cl remained const until about 50% of the Cl in $CuCl_2$ was driven off. It then sank to about 10% of its previous value and again remained const until all was given up. The reaction proceeds as follows: $4CuCl_2 + O_2 \rightleftharpoons 2CuOCuCl_2 + 2Cl_2$ and $2CuOCuCl_2 + O_2 \rightleftharpoons 4CuO + 2Cl_2$ Curves show the relation of % Cl by vol to time, temp. and velocity of O flow. The heat exchange, as calcd from the equil, is 18,350 cal per mol, the theoretical value as obtained from thermochemical data being 14,300 With $NiCl_2$ at 600° the rate of Cl liberation under a given set of conditions was const, indicating the reaction was as follows: $2NiCl_2 + O_2 \rightleftharpoons 2NiO + 2Cl_2$. The heat exchange per mol. was found to be 16,700 cal compared with the theoretical value of 16,600. With $CoCl_2$ the equil. is expressed by $3CoCl_2 + 2O_2 \rightleftharpoons Co_3O_4 + 3Cl_2$, the heat exchange per mol being 15,500 as compared with the calcd. value of 12,000. H. STOERTZ

Complex ferro salts. WILLIAM KÜSTER, E. ERFLE, E. v ROLL AND K. SCHILLER. *Z. physiol. Chem.* 155, 157–85(1926). --In addn. to the familiar complexes of the ferrocyanide type Fe^{++} forms complexes with numerous oximes. These are characterized by their blue or violet color and their soly in org. solvents, but thus far very few have been isolated and analyzed. The simplest deriv. of this type is the ferrite of nitrosopropionylacetone, where 2H in 3 mols are replaced by Fe^{++} and the 3rd H functions as a cation. The Fe^{++} has not the power of substituting 3 H, but because of its tendency

to become satd. coördinatively if it is capable of displacing the 3rd H. The 3 mols. of nitroso deriv. can thus satisfy the 3 remaining coördination positions of the Fe through the β-carbonyls, forming a coördinatively satd. system in which 3 avalent and 3 univalent groups participate, 2 of the latter being compensated by the Fe while the 3rd displaced H functions as a univalent cation. The complex thus remains univalent and occurs as an Fe-contg. anion. It may be designated a *hydrogen tri-(nitrosopropionylacetone)ferrite* with the following structure:



With homologs of nitrosopropionylacetone, RCOC(=NOH)COR′, it remained to be detd. which groups, R and R′, favor or inhibit the formation of a ferrite. Unfortunately, the ferrites, the formation of which is presumed from the deep blue color and the soly. in $CHCl_3$, are seldom sufficiently stable under present conditions for isolation and purification. It appears that where R in the general formula represents a simple alkyl and R′ an alkoxyl, the stability of the ferrite is diminished. If both R and R′ are alkoxyls (OEt) no ferrite forms; HON:C($CO_2Et)_2$, *e. g.*, gives only a fleeting blue coloration. The blue Fe deriv. of violuric acid is not a complex but a salt contg. Fe^{++} ions. If the carbonyls are adjacent to NH in a heterocycle no ferrite formation occurs. Nitrosophenylmethylpyrazolone gives an insol. dark green Fe deriv. which is a salt and not a ferrite. The ferrite of nitrosomethyl ethyl ketone persists only a short time, that of nitrosobenzyl methyl ketone decomps. in a few seconds, and nitrosobenzyl phenyl ketone forms none at all. Oxalylacetone and oxalylmethyl ethyl ketone give stable complex Fe^{++} salts contg. 1 Fe to 2 org. mols., indicating that here the 5th and 6th coördination positions on the Fe are occupied by CO_2Et. In the nitroso derivs. of β-diketones also the presence of CO_2Et plays a different role, *e. g.*, nitrosoethoxalylacetomethylanilide gives a bright red deriv. sol. in $CHCl_3$. The nitroso deriv. of dimethyldihydroresorcinol (dimedon) gives a blue complex analogous to the propionylacetone complex formulated above. A no. of analogous Co complexes were also prepd. The oxidation of the complex Fe^{++} salts of α-dipyridine and phenanthroline contg. Fe in the cation to Fe^{+++} salts is explained by coördination formulas. The following new derivs. were prepd. in connection with this work: *nitrosodipropionylmethane*, m. 49°, *2-propionyl-3-ethyl-5-methyl-4-carbethoxypyrrole*, m. 148°, *2-propionyl-3-ethyl-5-methylpyrrole-4-carboxylic acid*, m. 252°, *2,4-diethyl-3,5-dipropionylpyrrole*, m. 128°, and *nitrosoethoxalacetomethylanilide*, m. 143°. A. W. Dox

New complex tartrobismuthates. R. Portillo. *Anales soc. españ. fís. quím.* **24**, 420–31(1926).—If $H[Bi(C_4H_4O_6)_2]\cdot 3H_2O$ is dissolved in a hot aq. soln. of HCl, HNO_3 or H_2SO_4 there is a sepn. of a white, cryst. ppt. which has the formula $BiC_4H_4O_6R\cdot xH_2O$, where R is univalent. The H_2O content of these complexes varies and is probably not bound to the central atom because the complexes lose all H_2O *in vacuo* over H_2SO_4. Only the Cl compd. retains 1 of the 3 mols. of H_2O which are present at ordinary temp. so firmly that it is only given up above 120° with simultaneous decompn. All these complexes are insol. in H_2O but in alkali carbonates they dissolve readily with evolution of CO_2. The soln. remains slightly turbid. Thus in these compds. Bi is not fixed as an ion. The HCl and H_2SO_4 contents are at once pptd. by $AgNO_3$ or $BaCl_2$, so that the constitution is probably $[BiC_4H_2O_6]^{H_2}_{R}\cdot xH_2O$. The new complexes isolated were: $[BiC_4H_2O_6]H_2{}^1/_2SO_4\cdot 3H_2O$, $[BiC_4H_2O_6]H_2Cl\cdot 3H_2O$, $[BiC_4H_2O_6]H_2ClO\cdot 4H_2O$, $[BiC_4H_2O_6]H_2NO_3\cdot 5$ [or 8]H_2O. E. M. Symmes

The pyrocatechol (pyrogallol) compounds of stannic acid. R. Weinland and Moritz Maier. *Z. anorg. allgem. Chem.* **150**, 217–30(1926).—The coördination no. of quadrivalent Sn in its complex compds. with pyrocatechol is mostly 6. The pyrocatechol stannates of Ba and Ca are prepd. by adding first pyrocatechol, then Ca or Ba acetate to $SnCl_4$ in cold water. Compds. of the other metals are obtained by interaction with the resp. salts. All compds. prepd. except those of pyridine and quinoline are colorless but turn dark in air. They all contain water of crystn.

The most probable structural formula of the tripyrocatecholatostannic complex is $[H_4C_6 \cdot O_2 \cdot Sn(-OC_6H_4O)_2]M_2^I$. Thus it is assumed that 2 of the 3 mols. of pyrocatechol (OH groups) are attached by 1 real and 1 accessory valence to the Sn atom. The aq. solns. are stable in the cold, whereas pyrocatechol is split off on heating, $FeCl_3$ producing a green coloration in such solns. Ca and Ba compds. with more than 3 mols. of pyrocatechol for 1 Sn atom turn green immediately on addn. of $FeCl_3$, this phenomenon being in concordance with the assumption that only 3 mols. pyrocatechol form the "inner" complex, all others being located in an outer sphere. The following compds. were synthesized: the *NH_4, K and Ag tripyrocatecholatostannates* of the general formula $[Sn(OC_6H_4O)_3]M_2^I$ with 2, 4.5 and 5 mols. of water of crystn., resp., the *Mg, Ca, Ba and Zn tripyrocatecholatostannates*, $[Sn(OC_6H_4O)_3]M^{II}$ with 6, 8, 9 and 10 mols. H_2O, resp.; *Ca salt with "outer" pyrocatechol*, $[Sn(OC_6H_4O)_3]Ca + C_6H_4(OH)_2 + 4H_2O$; *Al tripyrocatecholatostannate* $[Sn(OC_6H_4O)_3]Al_2 + 30H_2O$, *pyridine tripyrocatecholatostannate*, $[Sn(OC_6H_4O)_3]H_2(py)_2 + 2H_2O$; *quinoline tripyrocatecholatostannate*, $[Sn(OC_6H_4O)_3]H_2(quin.)_2 + 2H_2O$, *piperidine tripyrocatecholatostannate*, $[Sn(O_6H_4O)_3]H_2(pip.)_2 + 2H_2O$; *ethylenediamine tripyrocatecholatostannate*, $[Sn(OC_6H_4O)_3]H_2en + 2H_2O$, *$NH_4$ tripyrogallolstannate*, $[Sn(O_2C_6H_3OH)_3](NH_4)_2 + 3H_2O$, *pyridine tripyrogallolstannate*, $[Sn(O_2C_6H_4OH)_3]H_2(py)_2 + 2H_2O$. EMIL KLARMANN

Reactions of some nitroso derivatives with alkaloids. ENRIQUE NAVARRO. *Anales soc. españ. fís. quím.* **24**, 413-9(1926).—The fact that nitro-β-naphthol ppts. with salts of Ni, Co and other metals, and that cupferron is the NH_4 salt of nitrosophenylhydroxylamine led to a study of the reactions which the nitro derivs. could give with alkaloid bases. The lack of effectiveness of these derivs. as reagents for detg. and sepg. alkaloids due to the differences being more of quantity than quality and the dependence upon concn., is fatal. The forms of the ppts. are not sufficiently characteristic to afford clear sepn. E. M. SYMMES

Determination, by the boiling point method, of the equilibrium constant relative to the formation of comlpexes with mercuric cyanide. F. BOURION AND E. ROUYER. *Compt. rend.* **183**, 390-2(1926).—$Hg(CN)_2$ forms double salts with alkali metal halides. For the system $KCl-Hg(CN)_2$ $k = 1.3$; for the system $KBr-Hg(CN)_2$ $k = 0.87$. The method of mixts. was used to calc. the b. p. elevation of the simple salts.
VAN DEN BOSCHE

Preparation of a chromium carbonyl through the medium of a magnesium derivative. A. JOB AND A. CASSAL. *Compt. rend.* **183**, 392-4(1926).—By the action of CO on C_6H_5MgBr, using $CrCl_3$ as a catalyst, the secondary product $Cr(CO)_6$ is obtained. It is a colorless compd., stable and sublimes at room temp. It does not catalyze the action of CO on the bromide. On heating above 200° it decomposes to Cr_2O_3, CO and Cr.
VAN DEN BOSCHE

The displacement of cesium and rubidium by iron. L. HACKSPILL AND H. PINCK. *Compt. rend.* **183**, 388-9(1926).—By heating the alkali salts with Fe, in vacuum, pure alkali metal can be obtained. Cs was obtained from the hydroxide, carbonate, sulfate and nitrate and Rb from the hydroxide and sulfate. The reaction begins at a temp. lower than the fusion point of the salt. Thus with Cs_2SO_4 (f. p. 1019°), Cs is freed at 750°. VAN DEN BOSCHE

The preparation of metallic germanium and the volatility of the metal in hydrogen and in vacuo. J. H. MULLER, E. F. PIKE AND A. K. GRAHAM. *Proc. Am. Phil. Soc.* **65**, 15-32(1926).—The relative degrees of purity of samples of Ge prepd. in different ways were studied metallographically and it was concluded that the metal prepd. by the reduction of specially purified GeO_2 with H_2, and graphite is the nearest to pure Ge. The metal is volatile in an atm. of H_2 below 800° and *in vacuo* below 760°. At atm. pressure 1 g. of Ge, melted and cooled in an atm. of H_2, absorbs 0.183 g. of that gas. Ge m. 959° in an atm. of H_2, 958° in an atm. of CO_2 and 975° *in vacuo*. GeO_2 is reduced to GeO when heated with metallic Ge *in vacuo*. The reaction begins vigorously at 800° and GeO is volatilized. A microscopic examn. of the polished and etched surfaces of the metal shows an interesting case of twinning crystals of Ge, produced by cold working the metal. R. E. GIBSON

Reactions on heating sulfides, carbides, silicides, phosphides, silicates and spinels with alkaline earth oxides. J. A. HEDVALL. *Svensk Kem. Tids.* **37**, 166-73(1925).—The substances indicated in the title were mixed with alk. earth oxides and heated, the first 3 groups in the presence of air or O_2, the others in N_2. BaO, SrO, CaO, MgO is the order of reaction intensity except with Ag_2S, with which CaO and MgO are reversed. BaO stands apart from the others in reacting at a defi-

nitely lower temp. This is explained by the formation of BaO_2. The sulfides are ZnS, Ag_2S and Cu_2S and their type reaction is: $BaO + ZnS + 2O_2 = BaSO_4 + ZnO$. For BaO reactions with the sulfides in the order given the temps are 321°, 343° and 342°, resp. In the graphs are shown striking bends in the curves at the critical temps. for BaO and SrO but not for CaO and MgO Cu_2S differs from the other 2 in that the reactions with the other alk earth oxides all take place at 377° instead of from 400° to 545°. There is a fundamental change in the Cu_2S at this temp., a conception supported by the sudden reaction with O_2 at 383°. The alk. earth oxides reacting with Cr_5C_2, $FeSi_2$, CaP_2 conform in kind with the sulfides and yield carbonates, silicates and phosphates, resp. The temps. are also similar; *e. g.*, for BaO 343°, 329° and 331°, resp. For the other alk earth oxides the temps are in excess of 400°. BaO-$FeSi_2$ react explosively The silicates were heated in N_2 and are represented by wollastonite, enstatite, sillimanite and rhodonite. The reactions gave metal oxides and alk earth silicates. For BaO the temps were 354,° 354°, 357° and 355°, resp. The data for SrO are nearly 100° more than these and for CaO 200° more. MgO is not included in these or subsequent tests The spinels were: $ZnO\cdot Al_2O_3$, $CoO\cdot Al_2O_3$, $CuO\cdot$-Al_2O_3, $FeO\cdot Cr_2O_3$, $CoC\ Cr_2O_3$. The roasting was in N_2 and for the chromite also in O_2. In the latter case the reaction takes place at the same temp. as in N_2 and $MCrO_4$ is formed. The spinel reactions are simple double decompns. except for the Co compd. in O_2, which also gives Co_3O_4 The temps are comparable with those for the silicates, except in that the table shows less difference between SrO and CaO in the Zn spinel series and the unusually high figure of 760° for a $CuO\cdot Al_2O_3$ A. R. ROSE

The compounds of quinquevalent molybdenum and the molybdic and tungstic acids with polyphenols and phenol acids. R WEINLAND, ADOLF BABEL, KARL GROSS AND HERMANN MAI *Z anorg allgem Chem.* **150**, 177-209(1926).—There are 3 diff. kinds of complex anions which molybdic acid (**I**) forms with pyrogallol (**II**); namely 1 mol. of **I** with 1 mol of **II**, or 1 mol of **I** with 2 mols of **II**, or 6 mols of **I** with 1 mol of **II.** The compds are vividly colored and resemble those with the pyrocatechol-molybdic anion previously described (cf *C A* **14,** 2309). They are difficultly sol in cold water; some are sol in MeOH and EtOH When the yellow WO_3 is heated with an aq soln. of pyrocatechol and NH_3, the NH_4 salt of a dipyrocatecholato tungstic acid forms. Other basic substances besides are capable of forming compds with 3 mols. pyrocatechol (**III**). No decision could be made whether all 3 mols of **III** are connected with the anion or perhaps one with the cation (aquo-type) Salicylic acid dissolves in aq. solns. of K_2WO_4 or Na_2WO_4, forming a K or Na salt of salicylato tungstic acid. The color of these compds is orange, they decompose with hot water. When WO_3 is heated with gallic acid or pyridine, the resp salt of a complex digallatotungstic acid results; it is very stable Molybdic acid is capable of formation of various compds with gallic acid (**IV**). The complex anions may contain 1 mol. of **I** with 1 mol. of **IV** or 1 mol. of **I** with 2 mols of **IV,** or 2 mols of **I** with 1 mol. of **IV.** The green chloro salts of quinquevalent Mo react with **IV** and a base, forming compds in which the anion is assumed to contain 1 mol of **IV.** The prepn of the following compds is described in the exptl. part of the paper. *NH_4 and pyridine monopyrogallolmolybdates*, $[O_2Mo(OH)OC_6H_3(OH)O]H.M$, the second with 1 mol of water of crystn. (M being the univalent basic compd); the *piperidine, pyridine, K and NH_4 dipyrogallolmolybdates*, $[O_2Mo(OC_6H_3$-$(OH)O)_2]H_2\ 2M^I$, with 0 2, 1 and 5 mols of H_2O, resp.; an *NH_4 tripyromolybdic pyrogallol compd.*, $[C_6H_3(MO_2O_7)_3]H_3\ (NH_4)_4 + 6H_2O$; a compd , $[C_6H_4(MO_3O_{10})_2]H_2\ (NH_3)_4 + 10H_2O$; *K monopyrocatecholatomolybdate*, $\left[O_2Mo\begin{matrix} OC_6H_4O \\ OH \end{matrix}\right]K + 2H_2O$; the *$NH_4$ and K dipyrocatecholatomolybdate*, $[O_2Mo(OC_6H_4O)_2]M^I_2 + 2H_2O$; *pyridine monopyrocatecholatomolybdate*, $[O_2Mo(OH)OC_6H_4O]H\ C_5H_5N + 1\ 5\ H_2O$; *K dipyrocatecholatomolybdate with "outer" pyrocatechol*, $[O_2Mo(OC_6H_4O)_2]K_2 + C_6H_4(OH)_2 + H_2O$; the *$NH_4$, piperidine* and *$PhNH_2$ dipyrocatecholatotungstates*, $[O_2W(OC_6H_4O)_2]M^I_2 + H_2O$; *pyridine, quinoline, o-* and *p-phenylenediamine dipyrocatecholatotungstates with 1 mol. pyrocatechol*, $[O_2W(OC_6H_4O_2)_2]H_2.M^I_2 + C_6H_4(OH)_2$; *piperidine dipyrogalloltungstate*, $[O_2W(OC_6H_3$-$(OH)O)_2]H_2\ (C_6H_{11}N)_2 + H_2O$; *K* and *Na monosalicylatotungstates*, $[O_2W(OH)OC_6H_4$-$COO]M^I$; *pyridine digallatotungstate*, $[O_2W(OC_6H_2(OH)_2COO)_2]H_2\ (C_5H_5N)_2 + 3H_2O$; *pyridine monogallatotungstate*, $[O_2W:O:C_6H_2(OH)COO]H.C_5H_5N + H_2O$; *Ba monogallatotungstate*, $[O_2W:O:C_6H_2(OH)COO]_2Ba$; *Ba monogallatomolybdate*, $[O_2Mo\cdot O\cdot$-$C_6H_2(OH)COO]_2Ba$; *pyridine* and *quinoline digallatomolybdates*, $[O_2Mo(OC_6H_2(OH)_2$-$COO)_2]H_2\ M^I_2$, the first with 1 mol. of H_2O or EtOH of crystn.; *pyridine monogallato-*

dimolybdate, $[(O_2Mo)_2O_4H_2C_6H_2(OH)COO]H.(C_6H_5N)_{1.5}$; *ethylenediamine and guanidine monogallatomolybdates*, $[O = Mo^V(OH)_2OHC_6H_2(OH)_2COO]H\ M^I$ with 1.5 and 2 mols H_2O, resp.; and *basic ethylenediamine monogallatomolybdate*, $[O = Mo^V(OH)_2OC_6H_2(OH)_2COO]_4H_4\ en_3 + 8H_2O$. EMIL KLARMANN

Citromolybdic acid. P. NYSSENS. *Bull soc. chim. Belg.* **35**, 132–5(1926).—Citromolybdic acid (I) is obtained by the action of hot solns. of citric acid (II) on an excess of MoO_3. I has the compn. 28.91% **II**, 65 00% MoO_3, 6 09% H_2O, corresponding to the mol. compn. 4 **II**.$12MoO_3$ $9H_2O$, the compd having 22 acidic OH groups It is concluded that in the *rapid detn. of* P_2O_5 by the phosphomolybdate method the temp should not be carried over 92° since at that temp. **II** is decomposed in the presence of HNO_3. Solns. of I will not dissolve pptd. NH_4 phosphomolybdate, but the presence of a large amt of I will prevent the pptn. of small amts of P_2O_5. W. B. PLUMMER

Precipitation of Al as hydroxide by means of ammonia (JANDER, RUPERTI) **2**. Action of HNO_3 on metals in presence of catalysts (PALIT, DHAR) **2**.

7 ANALYTICAL CHEMISTRY

WILLIAM T HALL

General report of the committee on pure analytical reagents for research work. A KLING (AND A. LASSIEUR). *Compt. rend 6e conférence intern chim (Bucarest)* **1925**, 288–99; cf K. and Schoorl, *C. A* **19**, 3229—The following limits for strength and for impurities (in mg. per 100 g), together with methods for their detn, are submitted $Na_2C_2O_4$: hygroscopic H_2O 10, Na_2CO_3 40, $NaHC_2O_4$ 30, Cl below 0 4, SO_4 below 5, heavy metals 1, insol. 10, K 3 5; *KOH and NaOH:* alky not less than 95% NaOH (of which not over 2 5% is Na_2CO_3) or 85% KOH (of which not over 2 5% is K_2CO_3), Cl 10, SO_4 5, PO_4 10, heavy metals 0, Fe 3, SiO_2 5, Al_2O_3 3, CaO 5, I_2: purity not less than 99.9%, non-volatile residue 20, $(CN)_2$ 6, Cl + Br (as Cl) 12; *Na_2CO_3 $10H_2O$:* after drying at 120°, not less than 99 8% Na_2CO_3, H_2O insol. 0, Cl 3, nitrates, cyanides, phosphates, sulfides and sulfites 0, SO_4 4 5, SiO_2 2, HCO_3 0, NaOH 80, K 7 3, NH_3 0, CaO, MgO, Fe 0, heavy metals 0, As 0 15, *NH_4OH soln :* in paraffin bottles same as last yr., and in addn. SO_4 0 25; *$K_2Cr_2O_7$:* K_2SO_4 500, Cl 10, CaO 50, MgO 10, Fe 10 **Report of the Danske Kemiske Foreningers Faellesraad for Internationalt Samarbejde.** A. C. ANDERSEN, R. DONS, GUNNER JOERGENSEN AND JULIUS PETERSEN *Ibid* 300–5.—Detailed directions are given for the detn. of alky., carbonates, Cl, SO_4, PO_4, heavy metals, Fe, SiO_2, Al_2O_3, CaO, NH_3 and nitrites in NaOH and KOH The indigo test for nitrates is not considered reliable, but no other test is recommended in its place. **Report on sodium oxalate.** S. P. L. SÖRENSEN. *Ibid* 305–7—Detailed directions are given for the detn. of H_2O, Na_2CO_3, $NaHC_2O_4$, org impurities and inorg impurities in sodium oxalate. **Determination of potassium in sodium oxalate and in sodium hydroxide.** EINAR BIILMANN AND (MISS) KARIN THAULOW. *Ibid* 307–8.—The following technic is recommended: ignite 1.34 g. (0 01 mol.) $Na_2C_2O_4$ in a Pt crucible to complete elimination of C, dissolve in hot H_2O, add an excess of pure HCl, evap. to dryness on the water bath in a Pt dish, heat to drive off the last traces of HCl, dissolve in 5 cc. H_2O, and to the cold soln. add 2 cc. of a cold soln. of 10 g. Na cobaltinitrite in 25 cc. cold H_2O. If the soln. does not remain perfectly clear for 1 hr. the $Na_2C_2O_4$ contains more than 3 5 mg. K per 100 g. $Na_2C_2O_4$. Quant. detn is carried out by comparison with mixts. of 4 N NaCl and 0.1, 0.2, 0 4 cc., etc., of 0 01 N KCl. The presence of 5.8 mg. K per 100 g. $Na_2C_2O_4$ gives an extremely slight ppt. Directions must be adhered to strictly; and if HNO_3 is used instead of HCl the reaction is much less delicate. The test is also applicable for detn. of K in NaOH. **Note presented by the National Research Council, Division of Chemistry and Chemical Technology (U. S. A.)** W. D. COLLINS. *Ibid* 308–9.—Limits for impurities in KOH, NaOH and $Na_2C_2O_4$ reagents are essentially the same as those recommended for adoption by the committee on reagents of the American Chemical Society. FRANCIS CARR. *Ibid* 310–3.—The standard of purity and tests for impurities of HCl, NaCl and Zn reagents are given, with comments explaining the reasons for which the particular conditions of each test were chosen. **Note presented by Greece.** C. ZÈNGHELIS. *Ibid* 314.—The conditions of the tests of $K_2Cr_2O_7$ were chosen so that negative results would indicate that the resp. impurities were present in amt. less than the max. given above **Report of the Consiglio Nazionale di Chimica.** (MRS.) M. BAKUNIN. *Ibid* 314–8.—Detailed directions

are given for the detn of impurities in $Na_2CO_3.10H_2O$ and I reagents. **Report of the Société Chimique de Roumanie.** St Minovici. *Ibid* 318–9.—Detn. of NH_3 in aq. ammonia is best carried out by pipetting a given vol into excess of *N* HCl and titrating the excess of the latter. Detailed directions are given for the standardization of $Na_2S_2O_3$ soln. by means of resublimed I. Sensitive and *stable starch indicator soln.* is prepd. as follows: dissolve 0.1 g. $HgCl_2$ in 225 g. of boiling distd. H_2O, add 0.5 g. sol. starch triturated in 25 cc. H_2O, let cool and filter. A. Papineau-Couture

Microsublimation. E. Kratzmann. *Mikrokosmos* **19,** 220–5(1925–6).—The methods of microsublimation in the analysis of drugs and org. materials generally are given. If a slide contg. the material to be examd. is covered with another slide in an inclined position the sublimate is spread out suitably for examn. The H_2O always condensed early in the heating must be expelled before the desired sublimate is obtained. Slides should be often changed to get a number of samples as well as to note variations with time of heating. The test reagents, such as KOH and H_2SO_4 solns., should be added with capillary tubes, the drops contg. not more than 0 1–0 2 cu. mm. Recrystn. from a solvent is necessary if the sublimed crystals are not good. Standing several days may convert an amorphous or oily form into a cryst. mass. H. F. K.

Analytical papers. IV. L. Pincussen. **Micro-determination of ions in organs and other material.** G Cronheim *Biochem. Z.* **171,** 7 14(1926); cf. *C. A.* **20,** 1256 --Org material is oxidized in a micro Kjeldahl flask by use of HNO_3 and 30% H_2O_2 and the residue is analyzed for certain ions. Na is pptd. by use of the Bell reagent (K, Cs, Bi nitrite soln), as the complex $9CsNO_2$ $6NaNO_2$ $5Bi(NO_2)_3$, and the Bi estd colorimetrically as Bi_2S_3 K is pptd after removal of NH_3, by use of Na cobaltinitrite, and the washed ppt is titrated with $KMnO_4$ as usual Mg is pptd. as $MgNH_4PO_4$ - $6H_2O$ and the P detd. colorimetrically. Phosphate is detd. by use of a molybdic acid-strychnine soln. and the turbidity produced compared with proper standards in a nephelometer. For halogens a special digestion with HNO_3 contg $AgNO_3$ is carried out, and the halogen is detd. as in the Volhard process. W. D L.

Determination of manganese in rich alloys. Elio De Luisi. *Met. italiana* **17,** 464–8(1925) —The following methods were examd. and compared: (1) gravimetric, (2) Volhard-Wolff, (3) bismuthate. Method (1) is sufficiently rapid to be used as a routine method, if the Fe is sepd. in the cold with cupferron. In method (2), if a temp. of 40° is employed, and stirring carried out energetically, concordant results are obtained. Method (3) is exact and may be simplified by breaking down the Fe alloy with Na_2O_2 Where any question is raised as to content of Mn in an alloy, method (1) should be official, since there are no special conditions that need be observed nor solns. to titrate, but all manipulations are reduced to simple filtrations. R S. P.

Determination of phosphorus in steels and cast irons. A. Mele. *Giorn chim. ind. applicata* **7,** 247–53(1925) —A critical examn was made of the methods in use, with the following conclusions: (1) The modified Finkener method gives good results and is often as exact as the classical $Mg_2P_2O_7$ method, if carried out under definite conditions. For P contents from 0.02 to 1 2% an approximation of 0.001–0.005% may be counted on, if a Gooch crucible is used, and the ppt is not dried at too high a temp., nor carried too far. (2) The volumetric method gives in general slightly elevated values, but in the presence of interfering elements, which retard the pptn. or take away P, the results tend to slightly lower values than those obtained with the control methods. With careful attention to details, variations are about +0.002 to —0 006% in the first case, for P contents up to 1%, and about —0 003% in the second case, for P contents between 0.035 and 0 095%, which for practical purposes are sufficiently exact. R. S. P.

Determination of silicon in gray cast iron. A. Terni and A. Amati. *Giorn. chim. ind. applicata* **7,** 255–7(1925).—By adding small amts. of chromic acid (0.5–1.0 g.) during the attack (by HNO_3-H_2SO_4), the graphite is completely oxidized and does not interfere with the detn. of Si. Robert S. Posmontier

Estimation of calcium sulfate in golden sulfide of antimony. Aldo Chiappero. *Giorn. chim. ind. applicata* **8,** 120(1926).—Weigh out 1 g. of the substance into a 500-cc. beaker, add 450 cc. H_2O and stir occasionally during 30 min. Filter through a tared Gooch or alundum crucible, and wash repeatedly by decantation or upon the crucible until the washings no longer give a ppt. when treated with NH_4 oxalate. Dry at 100°, and weigh. Robert S. Posmontier

Some improvements in the hydrogenation method for organic chemical analysis. H. ter Meulen. *Chem. Weekblad* **23,** 348–9(1926).—The ter Meulen-Heslinga methods for detg O, N, S, etc., by hydrogenation are modified in some respects. For the O detn. pure asbestos instead of platinized asbestos is suggested. For the N method the catalyzer has to be heated to 250° if N-evolving substances (hydrazine compds.) are used;

this temp. generally suffices for good results. If the S method is used on strongly charring substances the C tends to hold S back; it is suggested to mix the substance with 0.5 g. Pt-black. B. J. C. VAN DER HOEVEN

Determination of iodine in organic combination. C W. GEITER. *Am. J. Pharm.* **98,** 352 5(1926) —Mix 0 2 g. of sample (previously dried over H_2SO_4) with 3 g. of finely powd. K_2CO_3 in a porcelain or Ni crucible. Completely cover with 1 g. of the K_2CO_3. Heat moderately, gradually increasing the heat, but not exceeding a dull redness, until the mass is decarbonized Cool, dissolve in about 150 cc of distd. H_2O and transfer to a 500-cc. Erlenmeyer flask. Add 50 cc. of a soln of NaOCl (contg. about 2 5% Cl). Treat the mixt. cautiously with enough 50% H_3PO_4 soln to bring about an appreciable yellow tint of free Cl, then add 10 cc in excess and boil for 1/2 hr , or until vapors no longer react with KI-starch paper Cool to room temp. Add 10 cc. of an aq. soln. of KI (1:10) or enough to bring about a clear soln and titrate the liberated I with 0 1 *N* $Na_2S_2O_3$ W. G. GAESSLER

Citromolybdic acid (determination of P_2O_5) (NYSSENS) **6.** Experimental researches on adsorption (application to analysis) (CHARRIOU) **2.** Precipitation of Al as hydroxide by means of ammonia (JANDER, RUPERTI) **2.**

HOLMYARD, E J **Simple Qualitative Analysis.** London: G Bell & Sons, Ltd 38 pp. 1s. Reviewd in *Chem News* **133,** 63(1926)

ROSENMUND, K W. **Hilfsbuch zur Ausfuhrung der Qualitativen Analyse.** Berlin: Urban & Schwarzenberg. 86 pp M 4 20

8—MINERALOGICAL AND GEOLOGICAL CHEMISTRY

EDGAR T WHERRY

Covellite from Alghero, Sardinia. J W. H. ADAM *Beitr. Kryst. Mineral.* **3,** 1–60(1926)--The mineral occurs in the cementation zone of the deposit, and is of secondary origin. Many of specimens are described in detail. The crystn. is found to be hexagonal with p_0 = 2 483 and c = 2 150 Rather wide deviations of angles observed are due to accidents of growth Many of the crystals are made up of lamellas of progressively diminishing breadth, and the resulting layer-lines (Schichtlinien of Goldschmidt) are discussed Pyrite occurs in oriented positions on the covellite plates. E T. W

Cubanite or chalmersite? GEORG KALB AND M. BENDIG *Centr Mineral Geol.* **1926,** 25 —K. and B accept the results of Merwin, *et al.*, *C. A.* **17,** 3308 J. E GILL

Fizelyite, a new Hungarian silver ore. J. KRENNER AND J. LOCZKA. *Math. és Természettud. Értesitö* **42,** 18-21(1926) (Hungarian and German), *Mineralog Abstracts* **3,** 8.—Analysis gave: Sb 34 02, As 0 32, Pb 37 48, Ag 7.70, Fe 0 62, S 20 10, insol 0.30, corresponding to the formula $5PbS \cdot Ag_2S \cdot 4Sb_2S_3$. J F SCHAIRER

Crystal structure of the corundum-hematite group. F. ULRICH. *Norsk Geol Tidsskrift* **8,** 115-22(1925), *Mineralog Abstracts* **3,** 21.—The unit of corundum is a face-centered rhombohedron with edge 7 08 Å., and contg. 8 mols. Hematite is similar β-Al_2O_3 is hexagonal and γ-Al_2O_3 is cubic. J. F. SCHAIRER

Siderite. A. DE KLERK. *Beitr. Kryst. Min.* **3,** 85-103(1926).—Crystallographic descriptions are given of a number of siderite crystals, only 2 of them, however, of known compn. Many forms previously reported on this mineral are shown to be uncertain. E. T. W.

Determination of the plagioclases in thin sections. L DUPARC AND M REINHARD. *Mem soc. phys hist nat. Geneva* **40,** 1-149(1924), *Mineralog. Abstracts* **3,** 34.—D. and R. discuss the detn. of chem compn from optical properties. J. F. S

Zonal growth of plagioclase and soda-orthoclase in syenitic magma. T. ITÔ *J. Faculty Sci. Imp. Univ Tokyo* **1,** II, 105-9(1925) Zoned plagioclases are discussed with their relation to ternary silicate diagrams Although the system anorthite–orthoclase has not yet been worked out, I. gives a provisional ternary diagram for the system albite–anorthite–orthoclase J. F. SCHAIRER

Andesine from Bodenmais. J. KRATZERT. *Sitzber. Heidelberg ak. Math-Nat. Kl. Abt. A* **1923,** 11 pp.; *Mineralog. Abstracts* **3,** 35 —An analysis of andesine is given. There is no evidence of the presence of the carnegieite mol. J. F. SCHAIRER

Geology of the Obi Islands. H. A. BROUWER. *Jaarboek mijnwezen Neder-*

landsch. Oost-Indie **52,** 3–62(1924); *Mineralog. Abstracts* **3,** 37.—Mainly geological. An *analysis of pyroxene* is included. J. F. SCHAIRER

Minerals of the North Country: silicates. J. A. SMYTHE. *The Vasculum (Newcastle-upon-Tyne)* **10,** 66–9, 100–3(1924); *Mineralog. Abstracts* **3,** 24–5.—Two new *analyses of pectolite* are given. Other silicates described include anorthite, kaolinite and collyrite. J. F. SCHAIRER

Petrographic and x-ray study of the thermal dissociation of dumortierite. N. L. BOWEN AND R. W. G. WYCKOFF. *J. Wash. Acad. Sci.* **16,** 178–89(1926).—Dumortierite (possibly $8Al_2O_3.6SiO_2.B_2O_3.H_2O$) was heated and found to decompose into mullite with a little excess glass. Decompn. began at 950°, but was not rapid until higher temps. Quant. data are given on the loss of B_2O_3 on heating, all being lost in 4.5 hrs. at 1500°. X-ray data identify the decompn. product as mullite ($3Al_2O_3.2SiO_2$). The mineral is a good basis for refractory bodies and, on account of the loss of B_2O_3, may be regarded as essentially $4Al_2O_3.3SiO_2$. J. F. SCHAIRER

Clinozoisite and prehnite from Prosec-Voboriste near Pelhrimov, Bohemia. A. ORLOV. *Publ. Faculte Sci. Univ. Charles, Prague* No. **39,** 28 pp. (1925) (French résumé); *Mineralog. Abstracts* **3,** 49.—These minerals have been formed during a process of uralization and chloritization by thermal solns. of the parent rock. J. F. SCHAIRER

Titanobiotite (wodanite). W. FREUDENBERG. *Mitt. Bad. geol. Landes Anst.* **8,** 319–40(1921).—Wodanite (titanobiotite), occurring in a nepheline mica porphyry, contains 11–12.5% of Ti oxide. B. C. A.

Classification of the chlorites. J. ORCEL. *Compt. rend.* **183,** 363–5(1926).—The ratios $s = SiO_2/R_2O_3$ in which R_2O_3 = (Al, Fe, Cr)$_2O_3$, $f = FeO/MgO$, $a = Fe_2O_3/Al_2O_3$, and $c = Cr_2O_3/Al_2O_3$ form the basis of classification into 7 groups and 16 subgroups. L. W. RIGGS

Mineral occurrences in Trondhjemgebiet. C. W. CARSTENS. *Norsk Geol. Tidsskrift* **8,** 140–6(1925); *Mineralog. Abstracts* **3,** 25.—Analyses of *chlorite, epidote* and *stilbite* are included. J. F. SCHAIRER

Crystal structure of perovskite and related compounds. T. BARTH. *Norsk Geol. Tidsskrift* **8,** 201–16(1925); *Mineralog. Abstracts* **3,** 23.—Perovskite, dysanalyte and $NaCbO_3$ gave for the edges of the pseudocube containing one mol. 3.795, 3.826 and 3.890 Å. Dysanalyte is therefore an intermediate isomorphous mixt. J. F. S.

Fergusonite and allanite from Iyo, Shikoku. D. SATÔ. *J. Faculty Sci. Imp. Univ. Tokyo* **1** [II], 49–52(1925).—Crystallographic descriptions and analyses are given. Both minerals are radio active. The fergusonite contained 3.18% UO_2 and the allanite 1.84% ThO_2. J. F. SCHAIRER

Apatites in sedimentary rocks as indicators of the amount of atmospheric carbonic acid in the periods of deposit. W. MACKIE. *Geol. Mag.* **63,** 238–9(1926).—Soly. of apatite in H_2O is proportional to the CO_2 content. As this varies with compn. of the atm., so the amt. of apatite in sediments varies. The view that the CO_2 content of the atm. was greater in earlier geological periods does not agree with quant. data on the apatite content of sediments. Early periods believed on theoretical grounds to have had higher temps. than at present have also a high content of atm. CO_2. J. F. S.

Crystallography of vivianite from Rodna Vecche. F. ULRICH. *Rozpravy česke akad.* **23,** 9 pp.(1925); *Mineralog. Abstracts* **3,** 49.—Crystallographic. Twin-lamellas on (010) are due to incipient oxidation of Fe. J. F. SCHAIRER

The crystallography and physical properties of schafarzikite. L. TOKODY. *Z. Krist.* **62,** 123–6(1925).—An examn. of the crystals first described (*C. A.* **15,** 3263) gave: ditetragonal bipyramidal, c = 0.95381, color red-brown, opaque, metallic luster, hardness 3.5, sp. gr. about 4.3. The n is greater than 1.74, pleochroism strong, straw-yellow to brown yellow, double refraction weak. L. S. RAMSDELL

Kornelite. J. KRENNER. *Math. és Termeszéttud Értesitö* **42,** 1–2(Hung.) p. 3 (German), 1926, *Mineralog. Abstracts* **3,** 7. **Warthaite, a new mineral from Hungary.** J. KRENNER. *Ibid* **42,** 4(Hung.), 5(German), 1926. **Analyses of kornelite, warthaite, cosalite and semseyite.** J. LOCZKA. *Ibid* **42,** 6–17(Hung.), 20–1(German), 1926; *Mineralog. Abstracts* **3,** 7–8.—Kornelite is orthorhombic, violet colored, sol. in H_2O, sp. gr. 2.306. Analysis gave: SO_3 44.55, Fe_2O_3 30.17, CaO 0.06, Na_2O 0.11, K_2O 0.09, $(NH_4)_2O$ 0.03, FeO, CuO, P_2O_5 traces, H_2O 24.92%, formula $Fe_2(SO_4)_3.7^1/_2H_2O$. Warthaite is the Bi sulfosalt of the jordanite-meneghinite group, steel gray in color, with sp. gr. = 7.163. Analysis gave: Bi 28.18, As trace, Pb 54.53, Ag 1.01, Cu 1.05, Fe 0.17, S 15.31%; formula 4 (Pb, Cu, Ag)S.Bi_2S_3 (same as for "goongarite"). The cosalite analysis gave: Bi 42.34, Pb 36.23, Ag 1.50, Cu 3.41, Fe 0.19, S 16.33%; sp. gr. 7.13. Semseyite, Sb 28.34, Pb 52.49, Ag 0.13, Cu 0.06, Fe 0.06, S 18.93, insol. 0.21%; sp. gr. 6.05; formula $13PbS.6Sb_2S_3$. J. F. SCHAIRER

Minerals from the Simplon Tunnel. A. Pfaffenberger. *Beitr. Kryst. Min.* **3**, 61–83(1926).—Crystallographic descriptions are given of quartz, octahedrite, rutile, hematite, tourmaline, calcite, orthoclase, gypsum, celestite, sphalerite, pyrrhotite and pyrite. E. T. W.

General report for 1925. E. H. Pascoe. *Records Geol. Survey India* [1] **59**, 1–114 (1926).—Analyses of coal, Pb slags, Pb ore concentrates and pyrite-bearing rock are included. *Cryptohalite* ($2NH_4F.SiF_4$) was found in the Jharia coal field as crust at the surface after a coal mine fire, in amorphous, isometric and hexagonal forms. The last has been prepd. artificially but never found in nature. No mineral name is suggested for it. J. F. Schairer

New or incompletely described meteorites in the mineralogical museum of Harvard University. C. Palache. *Am. J. Sci.* **12**, 136–50(1926).—Eight meteorites, *viz.* pallasite from Ollague, Bolivia, Sierra Sandon iron, Taltal, Chile, Britstown iron, Cape Province, S. Africa, Cumpas iron, Sonora, Mex., Mount Ouray, Chaffee Co., Colo., Gun Creek, Gila Co., Ariz., Colorado River, La Paz, N. Mex. and the Anderson or prehistoric pallasite found in the Turner Mounds, Anderson, Ohio. The descriptions of these meteorites were made largely from a study of polished surfaces. Analyses of 3 of the Fe meteorites by Shannon are quoted. L. W. Riggs

Meteorite discovered in the department of the Gold Coast. Classification and nomenclature of the chondrites. A. Lacroix. *Compt. rend.* **182**, 1498–1501(1926).—The phys. features of the meteorite are described. L. W. Riggs

Age of a meteorite. F. Paneth and K. Peters. *Ber.* **59B**, 2041(1926).—Using spectroscopic sensitiveness as a method of estg. very small quantities of He, after extg. and purifying by means of liquid air and charcoal, the He-Ra ratio was found to yield an age of 600 million years for the Mount Joy meteorite. The same method is applicable in testing natural gases for He. One sample from a German source gave 0.19% He, which is the highest so far reported from Germany. R. C. Wells

Role of colloidal solutions in the formation of mineral deposits. H. C. Boydell. *Bull. Inst. Mining Met.* (discussion) No. **257**, 27–57(1926); cf. *C. A.* **19**, 805, 2009.—Further discussion of the application of colloid chemistry to geology. J. F. S.

Genesis of sulfide ores. H. Freeman. *Eng. Mining J. Press* **121**, 571–2(1926); cf. *C. A.* **20**, 885.—F. rejects the idea that "all ores now existing as sulfides were once chlorides." J. F. Schairer

Magmas, dikes and veins. W. Lindgren. *Eng. Mining J.* **122**, 125–34(1926).—After a review of the theories of various geologists on the origin of dikes and veins, L. defines a magma and discusses the many phys. and chem. forces which produced dikes and pegmatites, filled fissures and deposited ores. J. F. Schairer

Magmas, dikes and veins. J. E. Spurr. *Eng. Mining J.* **122**, 134–40(1926).—A summary of S.'s views on the nature of magmas and the origin of dikes, veins and ore deposits. An answer to Lindgren's objections (cf. preceding abstr.). J. F. S.

Mineral zones of Cornwall. H. Dewey. *Proc. Geol. Assoc. London* **36**, 107–35 (1925); *Mineralog. Abstracts* **3**, 43.—From base upwards D. recognizes the zones: (1) Sn and W deposited between 575° and 550°, (2) sulfides of Cu and arsenides; (3) sulfides of Pb and Ag (400°); (4) carbonates of Fe and Mn (150°). J. F. Schairer

Gunflint iron-bearing formation, Ontario. J. E. Gill. Can. Dept. Mines, *Summary Report* **1924-C**, 28–88(1926).—The remarkable Fe-bearing beds of the Gunflint district of Minn. appear in almost continuous outcrop to Loon Lake, Ont., and are equiv. in geologic age, yet no large ore bodies of the Mesabi type have been found in the latter province. Several localities, however, contain magnetite-rich beds, amenable to concn. L. W. Riggs

Manganiferous iron ores of Cuyuna district, Minnesota. C. Zapffe. *Trans. Am. Inst. Mining Met. Eng.* **71**, 372–85(1925).—Z. gives analyses of black and brown ores, with discussion of production, reserves and future possibilities. J. F. S.

Economics of the Cuyuna manganiferous iron ores. C. P. McCormack. *Trans. Am. Inst. Mining Met. Eng.* **71**, 386–97(1925).—The district can supply large quantities of Mn-Fe ore for steel manufacture. Analyses of high P (low Si) and low P (high Si) ores are given. J. F. Schairer

Phosphorus-iron ores on the Cuyuna Range. G. Thiel. *Eng. Mining J.-Press* **121**, 687–90(1926).—The P content of various ores was detd. Apatite accounts for its presence, but it is erratic in distribution. J. F. Schairer

The nickel and cobalt content of the Mechernich ores. Georg Kalb and Emil Meyer. *Centr. Mineral. Geol.* **1926**, 26–8.—Ni and Co are found to occur in Ni-rich bravoite $(Ni, Fe, Co)S_2$ and Ni-poor Co-Ni-pyrite. The minerals examd. are thought

to belong to a mixed crystal series FeS_2-$(Ni,Co)S_2$, probably with limited soly. between the end-members. J. E. Gill

Mineral investigations in southeastern Alaska. A. F. Buddington. U. S. Geol. Survey, *Bull.* **783-B,** 41–62(1926).—Two ore mills built during 1924 have stimulated renewed interest in prospecting for Au. Several claims are described. In a group of hot springs discovered on Baker Island, the compn. of the water is similar to that of the Baranof hot springs; temp. 43.5°. Several occurrences of high grade limestone are described. L. W. Riggs

The Nixon Fork country, Alaska. J. A. Brown. U. S. Geol. Survey, *Bull.* **783-D,** 97–144(1926).—While some Au has been mined in this region, the outlook for profitable mining is not favorable. Coal exists but its mining would have only a local interest. **Silver-lead prospects near Ruby.** *Ibid* 145–50. L. W. Riggs

Cléricy and Kinojevis map-areas, Temiscamingue and Abitibi counties, Quebec. W. F. James and J. B. Mawdsley. Can. Dept. Mines, *Summary Report* **1924-C,** 99–125(1926).—The geological conditions and the discovery of free or combined Au support the opinion that workable deposits may be found. L. W. Riggs

Gold deposits of Nova Scotia: a new hypothesis concerning the structural feature of the province. S. Brunton. *Bull. Inst. Mining Met.* No. **258,** 1–18(1926).—The Au deposits show an anticlinal structure dependent upon definite lines of faulting. The Au districts lie near or at the junctions of these fault zones. J. F. Schairer

A brief review of the principal base mineral resources of the Union of South Africa. C. J. N. Jourdan. *J. Chem. Met. Mining Soc. S. Africa* **26,** 328–36(1926). E. J. C.

Outline of the mineral resources of the Gold Coast. A. E. Kitson. *Geol. Survey Gold Coast* **1925** (London); *Mineralog. Abstracts* **3,** 28.—Economic minerals include Au, Mn, bauxite, diamond and Fe. J. F. Schairer

Ruby silver prospect in Alaska. S. R. Capps and M. N. Short. U. S. Geol. Survey, *Bull.* **783-C,** 89–95(1926).—This prospect, the Mint mine, is east of Chulitna on the Alaska R. R. Assayed samples showed wide ranges of Ag and small quantities of Au. L. W. Riggs

Geology and ore deposits of the Ducktown mining district, Tennessee. W. H. Emmons, F. B. Laney and Arthur Keith. U. S. Geol. Survey, *Professional Paper* **139,** 111 pp. (1926).—The history of the mines is given. The total production of Cu from them is 408 million lbs., of Fe 1.5 million tons. The ores carry small quantities of Ag and Au not profitable to sep. Although the ores carry nearly as much Zn as Cu, the former has not been recovered. An important feature of present mining practice in this district is the production of H_2SO_4 from the low grade SO_2 fumes of the blast furnaces. Over 70 analyses of ores and associated rocks are quoted, also 6 analyses of mine waters. The ore deposits are described from the mineralogical point of view. L. W. Riggs

Ducktown, Tennessee, copper district. W. A. Nelson. *Trans. Am. Inst. Mining Met. Eng.* **71,** 299–303(1925).—Data are given on production of Cu and H_2SO_4. When the price of Cu fell, the H_2SO_4 by-product kept the plant running. Cf. preceding abstract. J. F. Schairer

Cupriferous pyritic ore deposits of the Shibuki and Seki mines in the province of Bungo, Japan. T. Katô. *J. Faculty Sci. Imp. Univ. Tokyo* Sect. II, **1,** 65–76(1925).—The deposits are of hydrothermal metasomatic origin representing the latest phase of igneous activity. No Japanese deposits can be explained as an injected sulfide magma differentiated from the gabbro. J. F. Schairer

Geologic features of Bolivia's tin-bearing veins. F. R. Koeberlin. *Eng. Mining J.-Press* **121,** 636–42(1926).—Field observations lead to the conclusion that cassiterite (SnO_2) has been dissolved and redeposited at lower levels to yield high-grade Sn deposits. J. F. Schairer

Geology and mineral deposits of Windermere map-area, British Columbia. J. F. Walker. Can. Dept. Mines, *Memoir* **148,** 65 pp. (1926).—Au was first discovered in this district but only in small quantities. The Pb-Ag and Pb-Ag-Zn deposits are more important. The Paradise mine yields about 1000 tons of melting ore annually, running about 95% carbonate and 5% sulfide, and averages 40 to 45% Pb and 45 oz. Ag. L. W. Riggs

Geology and ore deposits of Stirling area, Richmond County, Nova Scotia. L. J. Weeks. Can. Dept. Mines, *Summary Report* **1924-C,** 199–217(1926).—The Stirling Zn deposits are replacements in parallel bands of an old volcanic complex, consisting in greater part of acid flows and tuffs. Ore is exposed for a length of 450 ft. The ore minerals are sphalerite, chalcopyrite and galena mixed with varying amts. of pyrite.

Traces of Au and Ag are shown in assays. The gang consists of blebs of silicate minerals representing unreplaced parts of the original volcanic rocks. L. W. RIGGS

Occurrence of zinc silicate ore of supposed primary origin. S. J. SPEAK. *Bull. Inst. Mining Met.* No **257,** 1 5(discussion) No. **258,** 1-13(1926) —Primary calamine from Broken Hill, Rhodesia, is described with evidence supporting its origin. An av. analysis of an impure dolomite and 2 analyses of the Zn ores are given. In the discussion the occurrence of calamine with other undoubtedly secondary minerals and the high H_2O content of the mineral are raised as objections to its primary origin. J. F. S

Influence of superimposed strata on the deposition of certain lead-zinc ores. R. A. MACKAY. (Discussion.) *Bull Inst Mining Met* No **258,** 25 32(1926); cf *C. A.* **20,** 886 —In the discussion, H C. Boydell rejects the explanation of the process of deposition described by M. and postulates deposition from colloidal solns. of magmatic origin. J F SCHAIRER

Mascot, Tennessee, zinc area. W A NELSON *Trans Am Inst Mining Met Eng.* **71,** 289-98(1925). --Data on production and paragenesis of ore are included J F SCHAIRER

Mineral deposits of Rutter map-area, Sudbury district, Ontario. T T QUIRKE Can. Dept Mines, *Summary Report* **1924-C,** 89-95(1926) —The most promising types of mineral deposits in this area are abrasives, fluxes and pottery materials, mica and graphite, and building stone. L. W. RIGGS

Eastern part of Matawin Iron Range, Thunder Bay district, Ontario. T L. TANTON. Can. Dept Mines, *Summary Report* **1924-C,** 1-28(1926) —Possibilities of pyrite Fe, Ag and Mo exist in this region. L. W. RIGGS

Geology of Volhynia. S V BELSKY, *et al* *Trans Volhynian Geol. Party, Investigations in 1923,* **1925,** 145 pp ; *Mineralog Abstracts* **3,** 27 Economic minerals include feldspar, muscovite, quartz, Fe-ores, clay, sand and peat J F SCHAIRER

Chemistry of the potash-bearing horizon of the Malagash salt deposit, Nova Scotia H. V. ELLSWORTH. Can. Dept Mines, *Summary Report* **1924-C,** 181 98(1926) Twenty samples, representing channel sampling foot by foot, normal to dip of strata were analyzed showing an av of more than 2% KCl. The Mg content and Ca salt content other than $CaSO_4$ were slight All of the Na, K, Mg and a very small quantity of Ca salts are present as chlorides. The insol. residues contained a large amt of SiO_2 much of it as microscopic crystals of quartz L. W. RIGGS

Limestone on Abitibi and Mattagami rivers, Ontario. WYATT MALCOLM Can Dept. Mines, *Summary Report* **1924-C,** 96-8(1926) —Three samples of limestone averaged over 95% of $CaCO_3$ The quantity appears large and forms a valuable reserve L. W. RIGGS

The mineralogy of some commercial garnets. W M MYERS *Am J Sci* **12,** 115-8(1926) —In 1922 the world's production of gem garnet was worth $68,000 which is approx 0 1 the value of abrasive garnet. Analyses of 1 Spanish and 4 American garnets show a wide range in their mineralogical compn considered as andradite grossularite, pyrope, almandite and spessartite. Color is of little value as a guide to the identification of the variety of garnet. L. W. RIGGS

Mining bentonite in California. J. MELHASE. *Eng Mining J.-Press* **121,** 837-42(1926).—Analyses of "otaylite" and "amangosite" yield, resp , the formulas $MgO \cdot Al_2O_3 \cdot 5SiO_2 \cdot 8H_2O$ and $MgO \cdot Al_2O_3 \cdot 5SiO_2 \cdot 7H_2O$ Alkali waters contg Na_2SO_4, Na_2CO_3 NaCl, $Na_4B_2O_7$ and $CaSO_4 \cdot 2H_2O$ caused the alteration of volcanic ash to form bentonite J F SCHAIRER

Origin of coal. F. FISCHER. *Z. deut geol Ges* **77A,** 531-50(1925) —Fungi and enzymes decompose wood, giving cellulose and lignin Cellulose is further broken down by the same agents and completely disappears Lignin loses its acetyl and methoxyl groups and forms humic acids. By dehydration of these acids, the humins of lignite are formed. Heat and pressure may develop bituminous or anthracite coals by driving off CH_4, CO_2, CO and H_2S. J. E. GILL

Age of the Samland (East Prussia) brown coal formation. O VON LINSTOW *Braunkohle* **25,** 338-40(1926).—The geology of the field is discussed. The formation is of medium age, probably dating over the period Middle Oligocene-Upper Miocene W. B. PLUMMER

Environmental conditions of deposition of coal. DAVID WHITE. *Trans Am. Inst. Mining Met Eng.* **71,** 3-34(1925).—A review, under the headings: swamp environment, soils under the coal beds, water, coal plants, muck, S and Si, climate, temp., deposition, selective biochem. decompn. types of coal, effects of water conditions on the initial compn. of the deposits. J. F. SCHAIRER

The principal lignitiferous deposits of Italy. ANON. *Rass. min. met. chim.* **65,**

34–41(1926). A tabulated survey of the deposits, including the location, geological features, valuation, present development, and chem. analyses. C. C. Davis

Deep borings in Ontario, Quebec and the Maritime Provinces. E. D. Ingall. Can. Dept. Mines, *Summary Report* **1924-C**, 240–6(1926).—Deep borings have been made in Cadada almost continuously since 1858. The work reported in 1924 is tabulated. Gas was reported from 11 borings and oil from one. L. W. Riggs

Variations of specific gravity of Japanese crude oils with special reference to their geological occurrence. T. Iki. *J. Faculty Sci. Imp. Univ. Tokyo* Sect. II, **1**, 53–64(1925).—Tables are given to show the variation of sp. gr. of the crude oils with depth and geological formation. The most remarkable influence on the oil character was the eruption of volcanic rocks, andesite, basalt, liparite and their tuffs. Oils have been changed to a thick heavy variety by the direct or indirect heat of volcanic action. Japanese low-grade oils are alteration products of the high-grade oils caused by distn. and destruction due to volcanic heat. J. F. S.

Magmatic activity and mountain folding in the Andes of South Mendoza. H. G. Backlund. *Geol. Mag.* **63**, 410–22(1926).—Through 5 minor cycles of igneous activity the granodiorites and their equivs. evolve, step by step, or phase by phase, towards a basic pole somewhat rich in K_2O. J. F. Schairer

Genetical interpretation of extrusive rocks. S. Tsuboi. *J. Faculty Sci. Univ. Tokyo* Sect. II, **1**, 77–86(1925).—T. shows from a consideration of ternary silicate diagrams that the bulk compn. of a porphyritic igneous rock does not represent the compn. of the original magma. Detailed detn. of the compn. of groundmass and phenocrysts together with their mutual relations is necessary. T. divides phenocrysts into 3 classes: (1) those just sepg.; (2) crystals dissolving by reaction with the residual liquid, (3) crystals surrounded so as to prevent reaction with the residual liquid, and discusses the significance of each. J. F. Schairer

Dispersion method of discriminating rock constituents and its use in petrogenic investigation. S. Tsuboi. *J. Faculty Sci. Imp. Univ. Tokyo* Sect. II, **1**, 139–80(1925).—The dispersion method of Merwin, described in detail, may be used in studying phenocrysts. The degree of homogeneity of each solid soln. crystal in rocks is a measure of the rate of cooling of the magma. J. F. Schairer

Probable origin of the members of the Bushveld igneous complex, Transvaal. C. G. S. Sandberg. *Geol. Mag.* **63**, 210–9(1926).—"Active magmas" result from the liquefaction of sedimentary strata yielding a eutectic granitic mixt. S. traces the differentiation in the Bushveld igneous mass. J. F. Schairer

Granite enclosures in a quartz-biotite-diorite at Green Islets, Southland. James Park. *Trans. Proc. New Zealand Inst.* **56**, 384–6(1926).—In a ridge of diorite on the shore, 2 masses of gray granite measuring 4 ft. and 10 by 20 ft. in diam., resp., are entirely enclosed. In the larger mass the granite in places shades into aplite. Chem. analyses of the diorite, granite and aplite show a pyrogenetic relationship arising from progressive differentiation, the granite being a phase of the diorite and the aplite of the granite. The compn. of the granite is: SiO_2 73.16, Al_2O_3 13.74, Fe_2O_3 0.35, FeO 1.48, MgO 0.31, CaO 1.60, K_2O 5.03, Na_2O 3.06, $-H_2O$ 0.46, $+H_2O$ 0.39, TiO_2 0.23, ZrO_2 0.02, P_2O_5 0.17, MnO 0.02, SrO 0.04, BaO 0.18, sum 100.24%. This differs from the diorite principally in having nearly 10% more SiO_2, more K_2O and Na_2O, but less Al_2O_3, Fe_2O_3, CaO and MgO. L. W. Riggs

Igneous complex of Green Island and the Amherst Coast, Lower Burma. L. D. Stamp. *Geol. Mag.* **63**, 399–410(1926).—The igneous complex shows a complete series of types from biotite-granite, through gneisses, aplites and muscovite-pegmatites. Evidence points to an exchange of material between xenoliths and the surrounding magma. All the rocks are mylonized, which is explained by movement during the final stages of crystn. J. F. Schairer

Studies of syenites from Ditro, in Transylvania. B. Mauritz, M. Vendl and H. F. Harwood. *Math. és Természettud. Értesito* **41**, 61–73(Hung.), 74(German), **1925**; *Mineralog. Abstracts* **3**, 35; cf. *C. A.* **20**, 2474.—Comprises analyses and petrographic descriptions of aegirine-nephelite-cancrinite-syenite, essexite-theralite, camptonite, tinguaite and hornblendite-beridotite. J. F. Schairer

Magmatic differentiation in the foyaitic rocks of Ditro. B. Mauritz and H. F. Harwood. *Mineralog. petr. Mitt.* **38**, 195–205(1925); *Math. és Természettud. Értesito* **41**, 241–51(Hung.), 252(German), **1925**; *Mineralog. Abstracts* **3**, 36.—Chem. analyses of rocks from the Ditro Mts. (Transylvania) and from the Mecsek Mts. are compared and differentiation diagrams given. J. F. Schairer

Stratigraphy and structure of the Cambrian slate belt of Nantlle, Carnarvonshire.

T. O. MORRIS AND W. G. FEARNSIDES. *Quart. J. Geol. Soc.* **82**, 250–303(1926).—Analyses of rhyolite, hornblende-andesite and dolerite are included J. F. S.

The Commander Islands. A study of the geography and natural history? J. MOROZEWICZ. *Warsaw institute Popierana Nauki* **1925**, 230 pp.; *Mineralog. Abstracts* **3**, 28.—Analyses of soda-rhyolite, alaskite, trachydolerite, andesite, beringite, augitite and oligocene tuffs are included. Many minerals are described. J. F. SCHAIRER

La Gomera. C. GAGEL. *Z. deut. geol. Ges.* **77A**, 551–71(1925).—A description of the geology of this island of the Canary group, with a geological map, sections and other illustrations. Five rock analyses are included. J. E. GILL

Teschenite sill of Charlestown, Fife. F. WALKER. *Geol. Mag.* **63**, 343–7(1926).—Analyses of gray veins in teschenite are included J. F. SCHAIRER

Geological structure of Ben Lawers and Meall Corranaich, Perthshire. G. L. ELLES. *Quart. J. Geol. Soc.* **82**, 304–31(1926).—Mainly geological. Analyses of hornblende schists and epidiorite are given. J. F. SCHAIRER

Volcanic rocks from Labe. J. DOUBEK AND V. VESLY. *Sbornik Statniho Geologického Ustavu Československe Republiky* **4**, 371–93(1924); *Mineralog Abstracts* **3**, 38–9.—Four rock analyses are given. The transformation of olivine to serpentine can be followed through 3 stages. J. F. SCHAIRER

Vulcano-glacial palagonite formation of Iceland. M. A. PEACOCK. *Geol. Mag.* **63**, 385–99(1926).—Palagonitization does not take place in the normal, almost anhyd. tachylytes which are characteristically opaque on account of the soln. or sepn. of Fe_3O_4, but attacks only hydrous translucent basaltic glasses which may be termed hydrotachylytes. J. F. SCHAIRER

Diopside-bearing pegmatite near Ellon in Aberdeenshire. H. H. READ. *Trans Edinburgh Geol. Soc.* **11**, 353–6(1925); *Mineralog Abstracts* **3**, 37.—A limestone adjoining pegmatite has been altered to a diopside-bearing rock. There has been a reciprocal enrichment of the pegmatite and limestone. J. F. SCHAIRER

Slates of Wales. F. J. NORTON. *Nat. Mus. of Wales, Cardiff* **1925**, 66 pp.; *Mineralog. Abstracts* **3**, 44.—Compn. of the slates is discussed and an extensive bibliography given. J. F. SCHAIRER

Contact metamorphism of some Colorado coals by intrusives. J. B. EBY. *Trans Am. Inst. Mining Met. Eng* **71**, 246–52(1925).—Analyses of coals show the amt. and trend of the carbonization of coal beds by intrusive dikes. Porosity and density tests were made. Megascopic examn. of the coal bed fails to show any effects beyond a lateral distance of 20 in. J. F. SCHAIRER

Subterranean penetration by a desert climate. E. B. BAILEY *Geol Mag* **63**, 276–80(1926).—The color of the Arran Carboniferous, abnormally red, sandstone did not percolate downwards as a stain from the overlying New Red sandstone but has been developed *in situ* through oxidation of Fe by air of New Red sandstone time and H_2O. J. F. SCHAIRER

Podsol in South Saghalien. T. WAKIMIZU. *J. Faculty Sci. Imp. Univ. Tokyo* Sect. II, **1**, 25–33(1925).—Podsol (light colored forest soil in cold humid regions with conifers) was studied microscopically and chemically. The results of mech. and chem. analyses are given. Colloidal material has been leached from the surface layers and concd. in a lower zone J. F. SCHAIRER

Genesis of black earths and other soils in the vicinity of Clermont-Ferrand. V. AGAFONOV. *Compt. rend.* **183**, 224–6(1926).—These soils are formed by the decompn. of volcanic ejections, among which scorias play a predominant role. L. W. R.

Radioactivity and the floor of the oceans. G. R. MACCARTHY. *Geol Mag.* **63**, 301–5(1926).—M. discusses the theories of Holmes (*C. A.* **20**, 887) and Joly (*C. A.* **19**, 2302) and shows that the explanation of geological periodic diastrophism cannot be based on the application of heat derived from radioactivity in the manner postulated by H. or J. J. F. SCHAIRER

Contributions to the theory of magmatic cycles. A HOLMES. *Geol. Mag.* **63**, 306–29(1926).—A discussion of thermal equil. of radioactive substances in the earth with its application to the broad problem of interpreting geological history. An answer to MacCarthy's criticism (preceding abstr.). J. F. SCHAIRER

Geochemical distribution law of the elements. VI. Crystal structure of the rutile type with remarks on the geochemistry of the bivalent and quadrivalent elements. V. M. GOLDSCHMIDT, T. BARTH, D. HOLMSEN, G. LUNDE AND W. ZACHARIASEN. *Skrifter Norske Videnskaps-Akad. Oslo, Mat.-Nat. Kl.* No. **1**, 21 pp.(1926); cf. *C. A.* **17**, 3664; **18**, 3161; **19**, 2764, 3391.—Compds. of the formula RX_2 were studied and the dimensions of the space lattices detd. for Mg, Mn, Fe'', Co, Ni and Zn fluorides and Ti, V, Mn, Cb, Mo, Ru, Sn, Te, W, Os, Ir and Pb dioxides. It is shown that if the ratio of R to

X is greater than 0.67, the fluorite crystal structure results while if the ratio is smaller the rutile type results. Relations of space-lattice to cleavage are discussed. The terms anti-isomorphism, iso-space lattice and anti-space lattice are introduced. Mossite and tapiolite are polyrutiles (trirutiles) in type. The unit cell of these is 3 rutile cells. These are called polymer isomorphs. The dimensions of their space lattices were detd. Zircon and thorite are octorutiles. **VII. Summary of the chemistry of crystals.** V. M. Goldschmidt, T. Barth, G. Lunde and W. Zachariasen. *Ibid* No. **2,** 117 pp.—A long and detailed summary giving data on exptl. methods, at. radii of all elements, data on possible isomorphism, antisomorphism, polymorphism and morphotropism Nineteen laws of the relations between atoms, at. no., crystal form, n, d. and degree of isomorphism are formulated. J. F. Schairer

Crystal structure of BeO (Zachariasen) **2.** Photographic goniometer (Rösch) **1.** The symmetry of sylvite and the nature of the etch figures (Herzfeld, Hettich) **2.**

9—METALLURGY AND METALLOGRAPHY

D. J. DEMOREST, ROBERT S. WILLIAMS

Gold and silver in 1924 (General report). J. P. Dunlop. Bur. of Mines, *Mineral Resources of U. S. 1924*, Pt. I, 503-40(preprint No. 24, publ. Aug. 14, 1926). E. J. C.

Gold, silver, copper, lead and zinc in Nevada in 1924. V. C. Heikes Bur. of Mines, *Mineral Resources of U. S. 1924*, Pt. I, 419-50(preprint No. 21, publ. Aug. 13, 1926). E. J. C.

Rare metals. Cobalt, molybdenum, nickel, tantalum, titanium, tungsten, radium, uranium and vanadium in 1924. F. L. Hess. Bur. of Mines, *Mineral Resources of U. S. 1924*, Pt. I, 451-76(preprint No 22, publ. June 7, 1926). E. J. C.

Modern metallurgy and ancient industries. W. Rosenhain. *Metal Ind* (London) **29,** 211-3, 244-6, *Chem. Age* (London) **15,** No. 375 (Metallurgical Sect.) 17-9 (1926).—A lecture. E. J. C.

Notes on ancient and primitive mining and metallurgical methods. T. A. Rickard. *Eng Mining J.* **122,** 48-53, 451-5(1926). E. H.

A new study of grinding efficiency and its relation to flotation practice. E. H Rose *Eng. Mining J.* **122,** 331 8(1926).—A so-called "grinding index" is derived by using 200-mesh size as a 100% basis, 1 5 in. round 0 18%, 0 5 in. 0.46%, 20-mesh 7 36%, 100-mesh 41.43%, etc. R discusses the means of deriving this index and offers proof of its applicability to practice. H. C. Parish

Mining and metallurgy in Sweden. J. G. A. Rhodin *Engineer* **142,** 136-9, 168 70(1926) —An historical account which begins with medieval times. D. B. D.

The briquetting and agglomeration of ferriferous ore dust. M. Ottolenghi. *Ann. chim applicata* **16,** 237-68(1926).—A crit. review and discussion (illus.) of the present practice and developments, with 35 references. C. C. Davis

Blast-furnace slag analyses. W. G. Imhoff. *Iron Age* **118,** 517-8, 612-3(1926); cf. *C. A.* **20,** 2969 - Complete slag analyses show how Fe indicates slag temp. Low Fe (0 3 0 5%) indicates hot slag, and high Fe, cold slag. A general classification of slags is based upon the chem compn. and the temp. The former varies from glassy, acid slag, to a dry, grainy "limey" basic slag. General characteristics of acid and basic slags are given, and the changes taking place in passing from acid to basic slags under 3 different ranges of temp —hot, medium hot and cold—are indicated. Characteristics of these types are given, 15 principles governing the interpretation of slag analyses are listed, and examples show reasons for "off" iron and how it can be corrected. The essential feature is to be able to recognize when the furnace needs lime on or off the burden and when a change of hearth temp. is all that is necessary. Some typical slag analyses are listed. W. H. Boynton

Service conditions of refractories for open-hearth steel furnaces. B. M. Larsen, F. W. Schroeder, E. N. Bauer and J. W. Campbell. Carnegie Inst. Technology, *Mining and Metallurgical Investigations Bull.* **23,** 1-126(1925).—Refractory service in 18 American open hearth shops is discussed. There are given analyses of checker and tunnel-wall deposits in several furnaces, also the concn. and compn. of the dust in the stack, checkers and port ends of a 50-ton basic open-hearth furnace, analyses of slag deposits and used brick taken from furnaces cooled down for rebuilding after a campaign of steel making, time-temp. and temp gradient curves of furnace walls, and tables

showing temp. distribution in the melting chamber. The probable causes of failure of refractories in open-hearth furnaces, and furnace design as it affects service of refractories are discussed. E. G. MEITER

Some factors influencing the rate of pickling of sheet iron. J E. HANSEN AND G. S. LINDSEY. *J. Am. Ceram Soc.* **9,** 481–92(1926) —Expts showed that: (1) freshly made H_2SO_4 bath pickles faster than one with much $FeSO_4$; (2) adding some old to a new H_2SO_4 bath is unnecessary; (3) increased $FeCl_2$ concn in an HCl bath increases rate of pickling; (4) $Fe_2(SO_4)_3$ in an H_2SO_4 bath increases the rate but soon changes to $FeSO_4$ and retards pickling, (5) decrease in acidity from normal decreases the pickling rate; (6) temp increase accelerates the rate, (7) iron annealed just before pickling loses 250 400% more during pickling, (8) using Monel baskets increases the pickling rate; (9) using HCl or NaCl in mixts. with H_2SO_4 retards the rate of pickling. C. H. KERR

The production of aluminum and of magnesium in Italy. PIERO GINORI-CONTI. *Rass. min met chim.* **65,** 30 3(1926). —A review of present developments. C. C. D.

The casting of aluminum. ANON *Brass World* **22,** 255–6(1926).—Oil- or gas-fired pot furnaces are best for Al melting Fe pots are generally used and give good results, unless the metal is overheated Ladles are of Fe lined with fireclay. In some European foundries the interiors of the crucibles are painted with Al-bronze varnish. 10–50% scrap metals, gates, etc. are used in the charges and $ZnCl_2$ enclosed in a box of Al, plunged to the bottom of the pot and stirred, causes the dross to rise to the surface where it is skimmed off. Ladle temp is more important as regards the quality of castings than the furnace temp The pouring temp is controlled by portable pyrometers. A neutral grayish appearance indicates too high pouring temp. Small shrinkage cracks can be welded by C_2H_2 W H BOYNTON

Composition of copper mats. B BOGITCH *Compt rend* **182,** 468 70(1926); cf. *C. A* **20,** 1583 —A diagram gives the equil curve of Cu-S-Fe alloys in a liquid state and at temps very near the solidifying points On gradual addn of Cu (above 3%) to a liquid Fe-FeS mixt. most of the Cu collects in the upper layer till the Cu content of the latter reaches about 50%. Further addns of Cu cause increase in the Cu content of the lower layer, up to 94 5%, and then again in the upper layer, until Cu_2S-Cu, free from Fe, is finally obtained. Applications of the diagram to metallurgical problems are discussed A PAPINEAU-COUTURE

Conflicting foundry methods. J G KAISER *Brass World* **22,** 263 4(1926) - The difficulties encountered in the production of castings of alloys contg Pb, Sn and Zn are enumerated. The demand for die castings of brass and bronze is increasing. A machine is available requiring 1-2 operators and capable of completing a casting operation of complicated nature in 20 30 sec The product is a finished precision article W H. BOYNTON

The use of standard tests of molding sands. H RIES *Trans Am. Inst. Mining Met. Eng.* Jan., **1926,** No. 1522-H, 3 pp.—A plea for standardization and a suggestion of the need of methods for detg such properties of molding sands as refractoriness and life, expression of grade or texture, etc. W. H. BOYNTON

Microscopic study of the old copper slags at Amba Mata and Kumbaria, Danta State, N. Gujarat, India. H. L CHHIBBER. *J Proc Asiatic Soc Bengal* **20,** 375–81 (1924). —A micro metallurgical description of slag from copper reduction processes carried on in ancient times J. W. SHIPLEY

Some examples of the practical application of phase diagram studies. K. L. MEISSNER *Metall u. Erz* **22,** 243-7(1925) —Metal *A* may be sepd from metal *B* by the addn of a third element *C*, where *C* has a greater affinity for *B* than *B* or *C* for *A*, and *A-C* will sep. from the liquid phase. In cases where *B* cannot be removed in a sep phase, addn of *C* may alter its crystal form so that it is not so objectionable. The following systems are discussed from their diagrams Bi–Cu–S, Fe–S–Mn, Pb–Ag–Zn, Sn–Fe–Si and Mg–Fe–Si in the first class, and Cu–Bi Ni and Al–Fe Ce in the second class. The third element indicated serves to remove or correct the second. C. G. K.

The measurement of temperature of molten metals. M. MOELLER. *Giesserei-Ztg.* **21,** 442-3(1924); *J Inst. Metals* **33,** 457.—The question of a suitable pyrometer for use in molten Zn, Sn, Pb and Al is briefly discussed, and it is suggested that the most satisfactory is an uncovered iron-constantan couple, the ends of which are not soldered together, but immersed separately in the molten metal, which provides the necessary junction. H. G.

Note on the softening of strain-hardened metals and its relation to creep. R. W. BAILEY. *J. Inst. Metals* (preprint), 14 pp.; *Engineering* **121,** 351–2(1926).—B. believes that a rational explanation of the phenomenon of *creep* is to be found in the balance of

the rate of production of strain hardening by distortion and the rate of its removal by thermal action. By using data obtained by other investigators upon non-ferrous metals, lines of const. hardness are plotted upon the log (time)-temp. diagram, and it is found that any 2 of these lines are a const. distance apart, measured parallel to the log (time) axis. This indicates that the mechanism of softening is a characteristic independent of temp except as to rate. Curves are shown for Cu, hardened by cold rolling to 53.2% and 71.2% reduction in cross-section; for sheet Al; for 65.35 brass tube cold drawn to a reduction of 35.4 and 16 8%; and for 70.30 brass strip reduced by cold rolling to 40%. These indicate that for most, if not all, metals the relation between the time T to produce a sp. softening and the temp. θ at which it takes place is of the form: $T = T_0 e^{-b\theta}$, in which T_0 is the time required to soften at zero temp, b is a const. for the particular metal, and e is the base of Naperian logarithms The values of b for the metals studied are as follows: Cu—0.089, Al—0 0725, 70:30 brass—0.0771, 65 35 brass—0.0502, low-C steel—0.05 The flow or creep which a metal experiences when subjected to stress at elevated temp. produces such characteristics that the curve of elongation plotted against time is roughly divided into 3 stages an initial stage in which the rate of extension decreases, a 2nd stage in which the rate is approx. const., and a 3rd stage in which the rate increases continuously to fracture This is discussed. The time to fracture is connected with temp. by the same law as the law for the softening of a strain-hardened metal, or if L is the length of life at temp θ, then $L = L_0 e^{-b\theta}$.

H. STOERTZ

Growth and consumption of metallic crystallites in conglomerates. RUDOLF VOGEL. *Naturwissenschaften* **12**, 473 80(1924); *J Inst Metals* **33**, 382—V.'s expts. point to the movement of grain boundaries in cast, unworked metals after solidification or during annealing at high temps In many metals several distinct systems of grain boundaries are formed. Mutual growth and consumption of the crystallites occur as they strive towards the form presenting the min of surface An atomistic explanation of grain boundary migration is given which maintains that concave portions of the crystal surfaces are more stable than the convex, and denies that grains are formed during recrystn by fragments, produced by cold work, growing by boundary migration H G.

Restraint of exaggerated grain growth in critically strained metal. G. L. KELLEY AND J. WINLOCK *J. Franklin Inst* **201**, 71 7(1926) —The literature and laws of grain growth in strained and reheated metals are reviewed, and attention is called to the importance of this growth in metals subjected to severe cold mechanical treatment with subsequent annealing An exptl. study has been made on samples of low-C steel and of Al to ascertain the effect of heating under various conditions at temps. below those at which exaggerated grain growth usually occurs. The samples were first cold-rolled sufficiently to cause rapid grain growth when heated to a suitable temp. Steel usually required a reduction of 5 to 15% to give exaggerated growth at 500° to 675°, while best results were obtained in Al with reduction between 15 to 25% and temps. from 340° to 400°. Series of these samples were then heated for periods of 30 min. to 96 hrs. at temps. ranging from 15° to 60° below the lowest temps at which grain growth had been observed They were then heated to temps. fairly high in the range in which growth had previously occurred, and observed as to whether growth was prevented entirely, inhibited, or not affected Irregular results were frequently obtained but in general the samples so treated exhibited either (1) no grain growth—(most common result) (2) partial or local growth or (3) general exaggerated grain (least common). No preliminary heating was sufficient to prevent growth in the Al at some higher temp. but the pre-heating tended to raise the growth temp. Steel samples behaved quite irregularly, especially those annealed above Ac_3 before cold rolling. Marked grain size contrast in the original steel sample favored complete restraint of coarse growth. The results indicated that exaggerated grain growth in critically strained metals may often, although not always, be restrained or even prevented by a previous heating for a more or less lengthy time at temps. below that at which this type of grain growth would normally occur.

D. F. MCFARLAND

The crystalline structure of metals. J. H. ANDREW. *J. Roy. Tech Coll. Glasgow*, No. **2**, 63–9(1925); *Science Abstracts* **29A**, 214–5.—This paper deals with some of the more theoretical aspects of the relation between cryst. structure and the phys. properties of metals and their alloys. Problems concerned with the at. structure of the crystal, and the grain boundaries in a multi-cryst. substance are discussed. H. G.

A photomicrographic study of the process of recrystallization in certain cold-worked metals. V. N. KRIVOBOK. *Trans. Am. Inst. Mining Met. Eng.* No. **1557-E**, 30 pp.(Feb., 1926) —Single crystals of an Fe-Si alloy contg. 1.76% Si were studied

The metal was hammered gently at room temp. until the thickness was reduced 25%, and the sample was then heated for 15 min. at 1400° F. Photomicrographic examn. after the cold working showed a large no. of straight lines running in several directions. At a magnification of 3000, these lines have thickness and saw tooth edges. After the heat treatment the specimen is polished and etched with HNO_3 and examd., the inner part remaining unchanged but progressive recrystn. having taken place as the outer part is approached. A series of photomicrographs is shown, from which it is seen that the markings produced by the cold working gradually open up into new grains. The intersection of markings is frequently the starting point of new grains, and in no case have new grains been found in the parts of the alloy between markings. K. states that this is not surprising if these markings represent the regions of max. distortion and contain either totally disorganized material (amorphous) or merely cryst material strained to a high degree. As the outer edge of the material is approached, recrystn has become more complete and the original markings are nearly gone. Two other samples of the same alloy were given the same amt. of working as the first sample (1). In one case (2) the heat treatment was not given until 3 days after the cold working; in the other case (3) the heat treatment was given after 15 min. The first sample was also given a 2nd heat treatment. On examn. this showed no further recrystn. The same structure was given by 2 as shown by 1 after its 1st heat treatment, but 3 was completely recrystd. Similar expts. were conducted with electrolytic Fe, except that photomicrographs are shown as the temp. was stepped up gradually. As the recrystn. progressed, the opening up of the markings produced by cold working is plainly seen, until finally these original markings are obliterated. In some cases the markings break up into small fragments, from which new grains open up. Cf. *C. A.* 20, 2139. H. Stoertz

A comparison of static and dynamic tensile and notched-bar tests. Kotaro Honda. *J. Inst. Metals* 1926 (advance copy), 11 pp.—The force applied in a tension test is resisted by the attraction between the atoms, and during breaking the atoms at the fracture surface are displaced. The work of actual breaking is very small, but larger in impact than in slow tests. Most of the work done is used up in deforming the specimen. In tensile tests, more energy is absorbed in impact than in slow testing because of a greater local elongation in the former. In bending tests this difference does not occur. The absorbed energy in impact tests is independent of the velocity of the blow. In repeated impact tests the energy may be dissipated without fatigue, or if it accumulates, forming cracks, fatigue is rapid. Charpy tests of the fatigued part of a specimen will show its condition at any stage of an endurance test. G. F. C.

Results obtained by dilation studies of castings. Pierre Chevenard and Albert Portevin. *La fonderie moderne* 19, 161–3(1925).—Dilation phenomena are valuable in studying graphitization of cementite (1). Si accelerates graphitization of white cast iron markedly between 600° and 875°. Carbides of Mn and Cr form solid solutions with (1), and their partition coeffs. between (1) and ferrite may be followed by dilation changes. C. G. King

The deformation of tungsten crystals. C. J. Smithells, H. P. Rooksby and W. R. Pitkin. *J. Inst. Metals* 1926 (advance copy), 9 pp.—Previous work on the orientation of worked W crystals is reviewed. Three W rods of different purity and coarseness were sintered and swaged, the changes in microstructure and x-ray diffraction pattern are discussed and illustrated. Coarse grains were first broken up in swaging; a fibrous structure developed in further working. The x-ray patterns show that a preferred orientation is produced in the later stages of working; the finer-grained rods showed this effect more quickly, as the fragments must first be smaller than a certain size. G. F. C.

Some further experiments on the behavior of single crystals of aluminum under reversed torsional stresses. H. J. Gough, S. J. Wright and D. Hanson. *J. Inst. Metals* 1926 (advance copy), 16 pp.; cf. *C. A.* 20, 2284.—The results of previous tests on single Al crystals are reviewed. A polished cross-section of a single-crystal bar that failed under alternating torsion showed 2 lines of "herring-bone" markings at right angles, representing differential hardening due to slip. A method of analysis of shear stresses is given, and the location of the markings is correlated with them. The hardness of the section varied with the intensity of the shear stress. Another specimen was tested in the same way, and its progressive hardening was traced in studying the method of fracture. The octahedral planes of the crystal were located by x-rays. Slip-bands corresponding to these planes were observed and photographed at various stages of the test. Slip was confined to the set of octahedral planes on which one of the resolved shear stresses was the greatest. In the stage of the test immediately preceding fracture slip did not occur, but fine cracks were propagated. G. F. C.

The production of single crystals of metals and some of their properties. H. C. H. CARPENTER. *Metal Ind.* (London) **28,** 543–6, 575–6; **29,** 31(1926).—Large crystals were produced in annealed Al sheet or round bars by a definite plastic deformation followed by a carefully controlled slow heating up to 600°. The peculiar distortion of single crystals in tension is described and explained. By x-ray tests the slip planes in Al were found to be the octahedral (111) planes, 2 planes generally being involved before fracture. The planes are also distorted by stress. Strain-hardening is due to plastic deformation and is not much affected by the original orientation. The direction of straining before crystal growth does not influence the orientation greatly, though certain orientations are avoided. Single-crystal bars of Al contg. 18.6% Zn had higher tensile strengths and more definite yield points than a normal bar of the same alloy. Single crystals not strained had no primitive proportional limit, and were extremely malleable and ductile. Brinell ball depressions in them were square with rounded corners. The work of Gough, Elam, Edwards, Goucher, etc , with single crystals is described. With Fe, the primitive proportional limit of a single crystal was 2 tons per sq in. The apparent isotropy of an ordinary metal bar when broken in tension is due to compensation between numerous crystals, and not to the properties of the individual crystal.
G. F. C.

The influence of gases on copper at high temperatures. I. A. G. LOBLEY AND DOUGLAS JEPSON. *J. Inst. Metals* March, **1926,** 13 pp —A special type of resistance furnace is described and shown diagrammatically. It can be evacuated or filled with any gas and the crucible can be lowered quickly into a H_2O-cooled chamber, permitting a controlled rate of cooling. Pure Cu was heated at various temp. between 1100° and 2300° in N, H and CO. To maintain a temp. of 2000°, 1550 amp. at 10.75 v. is required The temp. is measured by means of a Wanner optical pyrometer, and in each expt. the temp is maintained for 30 min. The vol. of the blow holes was detd. by measuring the apparent d. CO and N were found to be not absorbed by molten Cu up to 1900° in excess of that sol. in the metal. This was confirmed by the absence of blow holes and a const. d. of 8 96 at all temp. In the case of H, however, violent ebullition of gas takes place as the metal cools and blow holes are found. The macrostructure shows smaller grain size than in the N series The blow-hole vol. indicates a fall from 20% at 1100° to 10 66% at 1400°, and then rises again to a max. of about 20 2% near 1750°, after which it again falls as the temp rises, being 9 94% at 2180°. Observation of the period and intensity of the ebullition indicates that the amt. of H retained in the blow holes bears an approx relation to the amt. forced out of the metal on cooling. Curves showing blow-hole vol. and period of ebullition against temp. are given and photographs of macrostructure are shown. H. STOERTZ

The action of hydrogen on hot solid copper. C. S. SMITH AND C. R. HAYWARD. *J. Inst. Metals* **1926** (advance copy), 20 pp.—Tensile tests of Cu wire heated in H at various temps showed severe embrittlement occurring at 700° to 800°, but an improvement at higher temp. up to 1050°. The properties of wire gassed at 650° were also improved by annealing in H above 850°. These effects were explained by assuming a sintering action of H on Cu_2O Cu contg oxide should not be heated above 400° in a reducing atm. The penetration of H into cast Cu contg. 0.03 to 0 05% O increased uniformly from 800° to 1000°, but with 0.15% O the penetration showed a max. at 800° and was small at 900° to 1000°. The sintering action above 900° was assumed to close the cracks, affording easy access of H to the interior. The sintering was due to recrystn. promoted by the excessive disturbance by H of the Cu with high O; the Cu with low O did not recrystallize so much, and its cracks remained open. Photomicrographs supported this theory. The same action did not occur in forged Cu The penetration of H into Cu contg. 0.12% O at 900° decreased with time, but the rate was const. in Cu contg. 0.05% O. Etching by H was effective in showing the extent of gassing, and in Cu with 0.10% or more O radiographs also showed it. Gassed Cu annealed 45 min. in H at 1000°, then rolled at 950°, was restored in strength and had very high ductility, because of its purity and the sintering of the cracks. G. F. C.

Arsenic and nickel and their compounds with oxygen in copper, and their influence in small quantities on mechanical characteristics. J. RUHRMANN. *Metall u. Erz* **22,** 339–48(1925).—In small exptl. melts (100 g. Cu) R. found that As removed O from Cu_2O to form compds. of the type $(Cu_2O)_xAs_2O_5$, which were insol. in molten Cu. With very small quantities of Cu_2O, Cu arsenides are formed. If the As content of Cu is over 0.3% great care must be taken to keep the O content as low as possible. When Ni is present the O content exerts less influence. The elongation is almost const. with varying amts. of Ni, but increases with As. Hardness increases with Ni content and decreases with As. The O exerts little effect. Flexibility increases with Ni up to 0.3%

and then remains const., but with As, it increases up to 0.063% and then decreases. O decreases flexibility. Arsenic has a more favorable effect on erosion than Ni. O is deleterious. Curves, tables and photomicrographs are given. C. G. KING

Season-cracking in arsenical copper tubes. A. PINKERTON AND W. H. TAIT. *J. Inst. Metals* **1926** (advance copy), 6 pp.—Tubes of Cu contg. 0.44% As and deoxidized by P were compared with Cu tubes contg. low As and P, in regard to cracking after treatment in $HgNO_3$ soln. The tubes were made with various intensities of internal stress, which was measured. Four out of six arsenical tubes cracked, while the As-free tubes did not, although both kinds were equally stressed. Annealing at 240° prevented cracking, without softening. Also in *Engineering* **122**, 365. G. F. C.

Thermal anomalies of certain solid solutions. P. CHEVENARD. *J. Inst. Metals* **1926** (advance copy), 24 pp.—The anomalous transformations are gradual changes of state which do not affect the space lattice, but are shown by irregularities in the curves, representing variation of dilatation, elec. resistance, magnetism, etc., with temp. "X transformations" are distinct from the magnetic changes. The dilatometric anomaly of the α Cu-Al solid soln. occurred at 250° to 265°, in alloys contg. 1 to 16% Al, with a max. effect at 9.3%. Si and Fe did not affect it, but Mn diminished it. Ni-Cr alloys showed a similar dilatometric anomaly at 525° to 550°, with a max. at or above 37% Cr. The addn. of Mn reduced the anomaly, giving practically a linear dilatation with increasing temp. Cu-Ni alloys contg. 0.5% Mn showed an anomaly in resistivity, which is illustrated by curves. The point of inflection is const. at 450°; the amplitude is a max. at 52% Cu, the alloy constantan, or CuNi. In this alloy the anomaly counteracts the normal increase of resistivity with temp. G. F. C.

Studies to establish the affinity between the metals and sulfur. W. GUERTLER. *Metall Erz* **22**, 199-209(1925).—Phase rule diagrams and photomicrographs are given, with explanations, for the following systems: Cu-Pb-S, Bi-Cu-S, Sb-Mo-S, Pb-Fe-S, Ag-Fe-S, Ag-Pb-S, Cu-Mn-S, Pb-Co-S, Ni-Cu-S, Co-Ni-S, Ag-Cu-S, Fe-Cu-S, Sn-Cu-S, Sb-Pb-S, Sb-Cu-S, Sb-Ni-S and Pb-Ni-S. C. G. KING

The constitution of the alloys of silver and tin. A. J. MURPHY. *J. Inst. Metals* **1926** (advance proof), 18 pp. The constitution of the alloys of Ag and Sn are detd. by thermal analysis, microscopic examn. and elec. resistance. Ag holds 13.3% Sn in solid soln. at 724°, dropping to less than 11% at 100°. This solid soln. reacts with liquid to produce a new unrecorded phase β at 724°, contg. 14.5% Sn. The $\alpha + \beta$ field extends over 1% at 724°, widening to 3% at room temps. The β-phase is the sole constituent at 480° of alloys contg. 13-21.6% Sn; a peritectic reaction between β-solid soln. and liquid at this temp. produces the γ-constituent, Ag_3Sn. The $\beta + \gamma$ field widens as the temp. falls so that at ordinary temp. the β-solid soln. is confined to the range 12-19%. The constituent has a max. range of 1% at room temp. Alloys richer in Sn than the γ-constituent are composed of crystals of Ag_3Sn and Sn, or a very dil. soln. of Ag in Sn; the eutectic alloy contains 96.5% Sn and m. 221°. The solid soln. of Ag in Sn is less than 0.1%. A transformation occurs at 60° in the γ-constituent but no evidence has been found of the reported inversion at 232°. The presence of Ag prevents the change from white to gray Sn. Six plates of photomicrographs and 4 tables are included. ALBERT THOMAS FELLOWS

The constitution and the physical properties of the alloys of cadmium and zinc. C. H. M. JENKINS. *J. Inst. Metals* **1926** (advance copy), 35 pp.—The previous literature on Cd-Zn alloys is reviewed. The equil. diagram is given and discussed, showing 2 polymorphic transitions in Zn. The eutectic contains 82.6% Cd and m. 266°. At 353° near its upper transformation point, Zn holds 2.75% Cd in solid soln., but at the eutectic temp. the soly. is only about 2% and at room temp. under 0.25%. Cd dissolves over 2% Zn above 200°, but less than 1% below 100°. An alloy contg. 2.5% Cd, slowly cooled after long annealing, was solid at about 353° but was partly liquid between 300° and 266°. Undercooling is shown to interfere with the accurate detn. of the eutectic point. Photomicrographs illustrate the structures. The elec. resistance of either Zn or Cd was raised only slightly by the other element in solid soln. The mech. properties of Zn-rich and Cd-rich alloys as cast, rolled, aged or annealed are tabulated and discussed. The addn. of Cd improved the properties of Zn and decreased its grain-size. A small degree of quench-hardening and age-softening was found in the Zn-rich alloys; the Cd-rich alloys softened rapidly. After aging, the rolled Zn-rich alloys were very susceptible to grain-growth on annealing, giving poor ductility. The eutectic alloy had good strength and ductility. Cd seemed to improve slightly the resistance of Zn to corrosion. G. F. C.

Metallographical examinations of specimens of bronze from South America. AXEL HULTGREN. *Tek. Tid. (Bergsvetenskap)* **1923**, 67-8; *J. Inst. Metals* **33**, 383.—The

Brinell hardness of various kinds of ancient tools from Peru (such as pick, spit, axe, knife) has been tested. The material consisted of bronze with 0.7–13.4% of Sn. From the results of the tests it was clearly shown that the tools must have been cold-hammered to get a greater hardness. H. G.

Effect of casting temperature on the physical properties of a sand-cast zinc bronze. FRANCIS W. ROWE. *J. Inst. Metals* **31**, 217-24(1924), cf. *C. A.* **19**, 1686. H. G.

Bronze worm-gear blanks produced by centrifugal casting. F. W. ROWE. *J. Inst. Metals* **1926** (advance copy), 13 pp.—Although Al-bronze has been used for automotive worm-gears, most of them are now made of bronze contg. 10 to 13% Sn, as its structure gives good anti-friction properties and long wear. P is used as a deoxidizer and to improve the fluidity of the melt, but it does not reduce Sn oxide, and promotes brittleness. Pb and Zn must be low. Sand-cast gears are apt to be soft and porous at the roots of the teeth. Castings chilled at the outside are more sound, but lack the normal eutectoid structure at the chilled part. Die-casting with a sand core gives a more uniform structure, but centrifugal casting is still better. This process, which is in actual use on a large scale, is described in detail. The structures and properties of gear bronze cast in different ways are shown by photomicrographs and a table. G. F. C.

Bronzes in common use. E. G. JARVIS. *Brass World* **22**, 285-7(1926).—Compn. and methods of compounding and casting are considered. C. G. F.

The brittle ranges of bronze. W. L. KENT. *J. Inst. Metals* **1926** (advance proof), 8 pp; *Engineering* **121**, 349.—The brittle ranges of bronzes in the cast and annealed condition contg. 2-25% Sn were investigated by carrying out Izod impact tests at temps. up to 700°. Because of replacement of the δ constituent by the soft β, according to $\alpha + \delta \rightleftharpoons \beta$ the brittle alloys contg the δ constituent in the $\alpha + \delta$ eutectoid lose brittleness above 520°. The limit of solid soly. of Sn in Cu is about 15% (cf. Stockdale, *C. A.* **19**, 1685). ALBERT THOMAS FELLOWS

Investigations on the hot working of brass. KL. HANSER. *Z. Metallkunde* **18**, 247 55(1926).—The various methods of investigating the mech. properties of Cu-Zn alloys were compared to det which was the most suitable to illustrate the qualifications for hot working. Obtained data on fatigue test (*C. A.* **16**, 3864), compression, hardness (*C. A.* **18**, 3034) and brittleness together with H.'s expts. on tensile strength, elongation at elevated temps, the lateral contraction by this and the influence of the speed of elongation, all of which are exhibited in diagrams, are discussed and a comprehensive diagram is constructed. Conclusion: The lateral contraction exhibits the best characteristic for hot working qualifications, and an investigation of brasses, not yet sufficiently known as to the behavior under stresses applied on hot working, may be limited to the detn. of the lateral contraction. Six expts. are regarded sufficient, whereby 1 expt. at slow and 1 at faster elongation may give an idea concerning the sensitiveness of the speed of elongation. The tensile strength will be detd. simultaneously. With the results from this procedure at hand, the performance of hot working should be more easily carried out; otherwise expensive tests will be necessary, the accuracy of which is often questionable D. THUESEN

The technological behavior of pressed brass rods. W. KÖSTER. *Z. anorg. allgem. Chem* **154**, 197-208(1926).—The present work is an attempt to clear up the irregular mech. properties of pressed brass rods and the conditions causing splitting. As a result of cooling of the press block the structure, and at the same time the mech. conditions, undergo changes, varying from end to end of the rods. The effects of thermal and mechanical treatment were studied. D. THUESEN

Problems in extruding brass. LEON KROLL. *Brass World* **22**, 253-4(1926).—Accurate mixing and clean molds are important. Methods of judging the degree of heat are outlined and the advantage of pressing everything "bottom first" are indicated. W. H. BOYNTON

Preliminary experiments on the copper-magnesium alloys. W. T. COOK AND W R D. JONES. *J. Inst. Metals* **1926** (advance copy), 14 pp.—The properties of chill-cast Mg alloys contg. up to 10% Cu were detd. To prevent gas-holes in the castings the alloys were allowed to solidify in the crucible and were remelted just before pouring. The tightly closed bottom-pouring crucible that was used is described in detail. $MgCl_2$ and MgF_2 were used as fluxes. The molds were uncoated and hot. The foundry practice is fully described. The max. proportional limit was 3.5 tons per sq. in., with 6% Cu, the max. tensile strength was 9.7, with 2%; the ductilities and impact values were low Cu increased the hardness, sp. gr., and content of the eutectic of Mg and Mg_2Cu. The microstructures are illustrated. No trouble was encountered in machining. The method of chem. analysis is given. G. F. C.

Experiments on the brittleness of copper-nickel alloy for coinage. TSUGIO HIROSE. *Mem. Coll. Eng. Kyōtō* **3,** 1–45(1923); *J. Inst. Metals* **33,** 360.—Expts. on the hardness of the Cu-Ni used for coinage show that the hardness decreases with increase in the temp. of annealing. It is preferable to cool the alloy rapidly after annealing. Annealing at low temps. requires a long time. Specimens of the alloy annealed at 650° for 1 hr. never become brittle. A brittle bar cannot be made malleable by annealing; the only method of dealing with such a bar of metal is to remelt it. Suggestions are given for removing the troubles which occur during the minting of coins. Rapid cooling of a cast bar of the alloy produces crystals rich in Ni in a matrix rich in Cu, but slow cooling gives a coarser structure. The most efficient annealing can be produced in 1 hr. at 800–900°, but the same effect may be produced at lower temps. if the heating is carried on for longer periods. If the alloy contains an impurity such as O, annealing makes it brittle, because of the formation of a network of oxide throughout the mass. In such cases a semi-annealing of the alloy has to suffice. The most injurious substance in the alloy is O above 0.030%; this may be removed by the addn. of a piece of a Cu-Mg alloy to the molten metal. S is harmful if present to an extent above 0.076%; C is not very injurious to the alloy. H. G.

The mechanical properties at high temperature of an alloy of nickel and copper, with special reference to "creep." H. J. TAPSELL AND J. BRADLEY. *J. Inst. Metals* (preprint), 19 pp; *Engineering* **121,** 512–3(1926); cf. *C. A.* **20,** 732.—An alloy contg. about 70% Ni and 30% Cu, with 2.35% Mn was subjected to tension, torsion, notched-bar impact, hardness and fatigue tests at various temp., and the limiting *creep* stresses were detd. over a particular temp. range. The tensile tests were made at the ordinary rate of loading at temps. from 15° to 800°, and are tabulated, the ultimate strength holding up well to about 400°, when it fell off sharply from 33.2 tons/sq. in. at 400° to 28.3 tons/sq. in. at 500° and 20.3 tons/sq. in. at 600°, with 26% elongation and 26.5% reduction in area. The limiting creep stress was detd. between 400° and 700°, and is shown in curves and tables. At 400° it is 24 tons per sq. in., about 70% of the ordinary ultimate tensile strength, while at 600° it is 2.2 tons/sq. in., or only about 10% of the ordinary ultimate strength, and at 700° it is about 7% of the ordinary ultimate strength. Impact hardness tests showed a drop from 234 kg. m./cu. cm. at 15° to 151 kg. m./cu. cm. at 700°, with the sharpest drop at about 300°. In general this alloy is inferior at high temp. to 80:20 Ni-Cr. The values obtained are in good agreement with data obtained by other investigators on similar alloys. H. STOERTZ

Annealing cracking of the nickel silvers. E. O. JONES AND E. WHITEHEAD. *Trans. Am. Inst. Mining Met. Eng.* July, 1925 (advance copy), 16 pp.—The cracks which frequently occur in Ni silvers on annealing are associated with the change which takes place in these alloys at about 320°. Fire-cracking occurs at about 350°, and the cracks are intercryst. and oxidized. The conditions and manner of heating markedly influence the tendency to crack. There is less likelihood of cracking when the heating is uniform and gradual. Severely spun cups which cracked when annealed in the blow-lamp flame did not crack when heated in a muffle. Impurities in the material and unequal stresses, such as those caused through faulty rolling, also increase the tendency to crack. The phenomenon of crit. grain growth occurs in the annealing of Ni silver, the amt. of reduction necessary to produce crit. growth being 2%. This grain growth probably plays an important part in the cracking, and affords an explanation of the tendency of ingots which have received little reduction to crack on annealing. It is suggested that the ultimate cause of fire-cracking is the fact that at the cracking temp. the internal stress exceeds the tensile strength. This is caused by an increase in the internal stress at a temp. above 300°, and not by a falling-off of the tensile strength. By annealing at 250° for 1 hr. or at 300° for 1/2 hr. the stress is sufficiently reduced to enable the material to withstand the higher annealing without cracking, or at least to diminish greatly the probability of cracking. Another kind of cracking, different from fire-cracking, is caused by rapid cooling from temps. exceeding 600°. This occurred only in the alloys of highest Ni content used in the investigation, namely 20%. Unlike a fire-crack, the fracture of a cooling crack is not oxidized, but quite bright. B. C. A.

Aluminum castings of high strength. R. S. ARCHER AND ZAY JEFFRIES. *Trans. Am. Inst. Mining Met. Eng.* (preprint) No. **1590-E,** 26 pp.(1926).—The alloys and processes used in the production of Al castings are considered as to the effects on the utility and the cost of the finished casting. Sp. gr. and mech. properties are included in the first and the casting properties and machineability under the second head. Tests for suitability include: tensile tests, plasticity, aging and sp. gr. Casting characteristics are discussed and emphasis is given to the heat treatment of Al castings. The effect

of various alloy constituents and impurities are indicated. Also the commercial development of heat-treated castings. Room-temp. aging has a more marked effect in alloys made from high-purity metals, Al and Cu, than in No. 195 alloy according to recent lab. tests. W. H. BOYNTON

Special Alpax alloys. A. PETIT. *Rev. métal.* **23,** 418-31, 465-84(1926); cf. *C. A.* **20,** 570.—A much fuller account of the investigation and discussion of the results. with numerous photomicrographs illustrating the structure of the various alloys prepd. A. PAPINEAU-COUTURE

Silumin and its structure. BUNTARO ÔTANI. *J. Inst. Metals* **1926** (advance copy), 25 pp.; *Engineering* **122,** 336.—By thermal analysis and elec. cond. measurements, the equil. diagram of the Al-Si system was detd. The eutectic was found at 12.2% Si and 578°. Al retained 1.47% Si in solid soln. at 550°, and 0.43% at 360°. Silumin contg. 10% Si and 0.1% Na was used for expts. Remelting in air changed a modified alloy back to normal. Modification was produced by alkali fluorides and caustic soda, but not readily by other elements or fluxes. The effect of velocity of cooling was studied. Quenching an unmodified alloy from 578° while partly liquid produced as fine a structure as modification. Elec. resistance tests showed that no change of phase occurred in modification. Thermal analyses showed that Na prevented undercooling of the Al-Si eutectic, and gave a third heat evolution during cooling The ternary equil. diagram is shown and discussed. Na is assumed to form an immiscible liquid with Si as well as with Al. In the solidification of a modified alloy, a Na-rich liquid is claimed to isolate the growing crystals from the mother liquid, so that they cannot become coarse as in a pure Al-Si alloy. Other explanations of the modifying effect of Na are considered, but rejected. The structures are illustrated by photomicrographs. G. F. C.

Some mechanical properties of silicon-aluminum alloys. J. D. GROGAN. *J. Inst. Metals* **1926** (advance copy), 13 pp.; *Engineering* **122,** 341-2.—The processes of producing modified Al-Si alloys contg. 8 to 14% Si by means of Na or salts, are described. Ca was found capable of modifying chill castings. Chill-cast bars contg. 14.3% Si could be modified so as to show no massive Si when poured fast, but when poured slowly the structure was coarse. Alloys modified by Na were apt. to be unsound; when NaF and NaCl were used instead of Na, the results were better and more uniform. The results of mech. tests on modified alloys are given. Modified chill castings contg. 12% Si gave 13.4 tons per sq. in. tensile strength and 11% elongation. The hardness, yield point and tensile strength increased with the Si content; the elongation, impact value and d. decreased. The addn. of Zn raised the strength but lowered the ductility. Mg ruined the ductility. G. F. C.

The constitution and structure of the commercial aluminum-silicon alloys. A. G. C. GWYER AND H. W. L. PHILLIPS. *J. Inst. Metals* **1926** (advance copy), 1-31; *Metal Ind.* (London) **29,** 236-8 —Previous work on Al-Si alloys is reviewed. The normal eutectic contains 11 7% Si and m. 577°. When modified, the eutectic may contain up to 15% Si, and its f. p. is lowered. Typical structures are illustrated by photomicrographs. Modifying agents are listed, the commonest being Na, or alkali compds. Various theories to account for their action are discussed, the accepted theory being that they function as colloid protectors, retarding the aggregation of the Si and Al particles. Modification was attained by drastic chilling alone Cooling curves show that the thermal arrests are lower and more gradual in the modified alloys, and this is explained by assuming that the modifier reduces the speed of crystn. The effects of different amts of modifier were such as would be expected from a colloid protector, and are shown in detail. Similar modifying effects are shown in other Al alloys, Sb-Cu alloys, and especially by Al in Pb-Sb alloys. Agitation, long standing or the addn. of NaCl spoiled the modifying effect. The structural effect of Fe in the Al-Si alloys is discussed and illustrated by photomicrographs, and thermal diagrams up to 15% Fe are shown. The x-constituent contains 11.6% Si, and 0.8% Fe. Another Fe constituent is found when the Si is high, and is called "delta " The x-constituent is not affected by modification. Also in *Engineering* **122,** 458-60, 492(1926). G. F. C.

Properties of the modified aluminum-silicon alloys. D. STOCKDALE AND I WILKINSON. *J. Inst. Metals* **1926** (advance copy), 31-43; *Metal Ind.* (London) **29,** 238-9.—Mech. properties of modified Al alloys contg. 8 to 15% Si, chill-cast and sand-cast, are tabulated and plotted on diagrams. These alloys have better casting qualities and resistance to corrosion than the other Al alloys contg. 8% Cu or 2.5% Cu and 12 5% Zn. A modification is thorough, the tensile strength increases up to 15% Si, but the impact resistance decreases with increase of Si. In regular foundry practice it is safer to keep the Si at 11%, to obtain good shock resistance and to avoid risk of trouble from imperfect modification. The amt. of modifier used should vary with the Si

content. Delay in pouring after modification must be controlled. Fe in the alloy seriously decreases the ductility and shock resistance. Fatigue tests showed endurance limits around 3 tons per sq. in. The foundry practice is outlined. Sand-castings should be air-cooled as soon as possible. Also in *Engineering* **122,** 492–4. G. F. C.

Modification and properties of sand-cast aluminum-silicon alloys. R. S. ARCHER AND L. W. KEMPF. *Trans. Am. Inst. Mining Met. Eng.* Feb. **1926,** No. **1544-E,** 39 pp.—The structure of Al-Si alloys is refined materially with consequent improvement of phys. properties by certain treatments applied to the molten metal before casting The constitution of the alloys, the modification effect and a theory for the latter are discussed. The modifying process is discussed in detail and some suggestions are made for its practical application. Tensile properties are given for a series of normal sand-cast Al-Si alloys. Metallic Na produces as good and as uniform modification as the salt flux and is more economical Good modification requires that the molten alloy contain definite amount of Na at the moment of casting. This amount varies with the Si content. The phys. properties of the alloys are pointed out; for all compns. both strength and elongation are improved by modification. The effect of added Fe to the modified alloys is discussed W. H. BOYNTON

The importance of silicon in the mechanical improvement of aluminum with lithium or magnesium. P. ASSMANN. *Z. Metallkunde* **18,** 256 60(1926); cf *C. A.* **20,** 1585.—The present work is an investigation of the improvement in hardness brought about by thermal treatment of Al-Mg and Al-Li alloys with various Si content Specimens were annealed 1/2 hr. in a salt bath at 525°, quenched and aged 5 days at 18°, 100° and 200°. Al-Mg alloys aged at 18°, showed 60% increase in the Brinell hardness at Mg: Si = 1:0 6, Al-Li alloys about 50% increase at Li Si = 1:1 15-1 35. These proportions correspond practically to the compds Mg_2Si and Li_3Si A change in them caused in all cases considerably lower mech. values on heat treatment The formation of silicide also explains the fact that alloying with 0 5-0 7% Mg or 0 25 0 3% Li is sufficient to obtain the max hardness of com Al (about 0 4% Si) Aging at 100° of Al-Mg alloys caused a decrease in the hardnesses obtained at 18° when the Mg content exceeded 1% and was evidently independent of the Si content. Al-Li alloys were more sensitive to aging at higher temps and the improved hardness could be retained only in specimens with a small content of Li. Aging at 200° caused in all cases partial or complete loss of the improved hardnesses. Al-Li alloys with the most favorable mech. properties were alloyed with up to 4% Cu or 12% Zn and given the same thermal treatment and aging. Such alloys showed in all cases a further improvement in the total hardness when aged at 18°, and was in general highest for Al:Li Cu alloys The max. hardness (about 100% increase) showed an alloy with 2% Cu and 0 67% Li_3Si The hardness decreased with the increase of Li_3Si, the decrease being about equal for alloys with 4% Cu and 12% Zn, resp. Aging at 100° caused a further increase, in particular in alloys with smaller content of Li, and a similar decrease in hardness with increased amts. of Li_3Si, as for alloys aged at 18°. Zn seemed without improving effect on these alloys when aged at 100°; mostly a decrease in hardness could be noted Aging at 200° caused in all cases a total loss of the effects obtained. The following conclusions are drawn: Aging of Al-Cu-(Zn-)Li alloys at room temp causes hardness which does not increase in the expected way with the content of Li_3Si, as is the case for alloys free from Cu and Zn. The presence of Cu or Zn diminishes the hardening effect of Li_3Si. The improved hardness obtained on artificial aging at 100°, which for Cu-bearing alloys for a greater part must be credited this metal, is considerably diminished with the increase of Li. From the equil. diagram of the binary system Al–Li up to 12 1% Li, it is concluded that the alloys in liquid form contains the metals completely dissolved in each other, in solid form only partly. The limit of satn of the α-mixed crystals (Al-side) was 3 5% Li at the m p. and 2 2% Li at room temp. An eutectic was found at 7.8% Li with m p. 598°. The temp. of starting solidification sank with the increase of Li until the eutectic point was reached, then again rose, being 695° at 12 1% Li (cf. *C. A.* **20,** 1843). The mech. improvement brought about in Si-bearing Al-Li and Al-Mg alloys on thermal treatment is explained by the following hypothesis: As the soly. of Li_3Si and Mg_2Si decreases with sinking temp., the system is converted into a metastable form on quenching and contains the silicide in supersatd. soln., which during aging seps. highly dispersed and causes the hardening. When the alloys are aged at temps. ≧ 200°, the sepn of silicide is too coarse to cause any hardening. When these alloys also contain Cu or Zn, an additional sepn of $CuAl_2$ or β-soln. AlZn takes place and increases the hardening effect. D. THUESEN

Duralumin, its composition and treatment. S. H. PHILLIPS. *Am. Machinist* **61,** 371, 374(1924); *J. Inst. Metals* **33,** 346–7.—The compn. and methods of alloying and

casting duralumin are described, the importance of accurate temp. control of metal and molds being emphasized. Ingots can be rolled directly as cast, without preheating. The temp. of rolling, severity of "pinches," annealing details, and heat-treatment are discussed. The mech. properties, costs and types of hot-forgings are discussed. Duralumin sand-castings are distinctly inferior to castings of high-grade Al-alloys, the elongation being practically nil. Protective varnishes and the excellent resistance to corrosion of duralumin even when unvarnished are discussed. Nearly every case of corrosion so far experienced in actual practice has been traced to incorrect heat-treatment (*e. g.*, too slow a rate of cooling) or to cold working after heat-treatment. The machining and anti-frictional properties are shown to be very satisfactory. H. G.

Aluminum-cadmium-zinc alloys. N. F. Burden. *Brass World* **22,** 247–50 (1926).—A preliminary survey was made to obtain information regarding alloys of Al to permit comparison with other binary and ternary alloys. The range of 28 alloys studied included mixts. contg.: Zn, 0–24%, Cd, 0–10% and Al, 66–100%. They were subjected to the following tests: forging, rolling, spinning and hardness tests, hardness (cast material) and tensile properties (cast and rolled materials). Data are tabulated. W. H. Boynton

The influence of the compound $MgZn_2$ on the workability of aluminum alloys. W. Sander and K. L. Meissner. *Z. anorg. allgem Chem.* **154,** 144–51(1926).—Eger's equil. diagram of the ternary system Al–Mg–Zn, which lacks a closer investigation of the Al-rich field, is revised and reconstructed. Considerable amts. of $MgZn_2$ are present in solid soln. in this field. As the new diagram exhibits the same conditions as the quasi-binary system Al–Mg_2Si (*C. A.* **16,** 231), it could be expected that $MgZn_2$ in amts. of max 28% and min. 4–5% would improve the mech properties. Alloys with 4–11% $MgZn_2$ were prepd., which after rolling and forging were annealed 10–15 min. at 550° and quenched in water. The mech properties of these showed that technically valuable alloys could be obtained when the constituents were calcd so as to form the compd. $MgZn_2$ exclusively. Such alloys had a tensile strength of 45 kg./sq. mm. on 20% elongation Expts. with alloys contg 9% $MgZn_2$ and aged at higher temps. showed a further improvement in the mech. properties When alloys of high tensile strength (52 kg./sq. mm.) are wanted, an aging temp. of 80° and an aging period of 10 hrs. should not be exceeded. D Thuesen

Lautal. V. Fuss. *Z. Metallkunde* **16,** 313(1924); *J Inst. Metals* **33,** 346; cf. *C. A.* **19,** 2804 —Lautal is an alloy contg. not less than 93% Al, the remainder being Cu, Si and the usual trace of Fe. It may be strengthened by a combination of cold-work and heat-treatment. Tensile strength is 38–43 kg. per sq. mm., with an elongation of 18–23%; it may be worked up to 60 kg per sq mm., with 4% elongation; the yield point of the normal material is 30–33 kg per sq mm. The modulus of elasticity amounts to 600,000–700,000, according to treatment. Hardness, about 92 Brinell normally, may be increased by subsequent treatment. Sp. gr. is 2.7 to 2.8. After heat-treatment no age-hardening occurs, and the alloy can be repeatedly heat-treated without variation in the results produced. It is claimed to be easily worked, forged and drawn, and to possess great resistance to sea water and other corrosive influences. H. G.

The constitution and age-hardening of some ternary and quaternary alloys of aluminum containing nickel. Kathleen E. Bingham. *J. Inst. Metals* **1926** (advance copy), 17 pp.—The age-hardening of Al alloys contg. 2, 4 and 6% Cu, resp., and 0.2 to 2% Ni was investigated. The alloys were cast in graphite, forged, annealed, quenched from 500°, and tested for Brinell hardness after aging for various periods or tempering up to 200°. Slight age-hardening, if any, was due to $CuAl_2$, and not to $NiAl_3$. Ni suppressed the age-hardening by increasing the soly. of $CuAl_2$ at low temp. The effect of 1 or 1.5% Mg in these alloys was investigated, 0.13% Si also being present. Their constitution is shown by diagrams and photomicrographs. With 4% Cu, 2% Ni and 1 to 1.5% Mg, Mg_2Si and $NiAl_3$ were pptd. on cooling from 500° to 200°. Other complex changes are noted, and marked age-hardening due to the pptn. of Mg_2Si was found. The hardest alloy contained only 0.2% Ni, and $CuAl_2$ probably helped to harden it. G. F. C.

Chromium alloys resist chemicals. C. E. MacQuigg. *Trans. Am. Inst. Chem. Eng.,* June, **1926;** *Iron Age* **118,** 416–8(1926).—Resistance of alloys to corrosion may be due to low soln. pressure or the formation of a protective film. Cr in ferrous alloys imparts resistance to oxidation by the latter means. A table and chart give the results with different Cr contents, 20% being sufficient to give the min. loss of wt. by oxidation at high temp. Cr-Ni-Fe alloys resist many solns. Cr-Fe alloys are attacked by HCl; they have good mech. properties, and may be joined by fusion welding if a flux is used to remove the oxide. Also in *Chem. Met. Eng.* **33,** 609–11. G. F. C.

Effect of nitrogen on some chromium and iron-chromium alloys. F. ADCOCK. *J. Iron and Steel Institute* Aug. **1926** (advance proof), 10 pp.; *Engineering* **122,** 308–9.—Samples of pure Fe, Cr and Fe-Cr alloys were treated with N for 30 to 50 min. by passing the gas over the surface of the liquid metal in a high-frequency induction furnace. The microstructure and hardness were compared with less pure alloys contg. N made in a C-ring furnace. The results show (1) approx. only 0.02% N is absorbed by liquid Fe. (2) N is readily absorbed by liquid Cr up to 3.9%. (3) Fe-Cr alloys both liquid and solid (at high temp.) take up N, the amt. retained increasing with the Cr content. (4) In alloys of compn. near 12% Cr quenched above 900°. A martensitic structure with hardness (Brinell 2-mm. ball, 40 kg.) 315 results while in the annealed state the hardness is 115. (5) Alloys in the range 20–60% Cr usually present a two-phase microstructure. One constituent invariably develops a sorbitic or pearlitic structure on suitable heat treatment but without marked hardness changes. The "criss-crossed" microstructure of the matrix gradually disappears with slower cooling rates or lower quenching temps. The pearlitic structure is never found in pure Fe-Cr alloys. Thus N can give rise to structures analogous to those caused by C in ordinary steel.
R. H. ABORN

Nickel affects gray iron. T. H. WICKENDEN AND J. S. VANICK. *Foundry* **54,** 689–90(1926).—Ni over 1% reduces combined C to 0.8% in cast Fe, and above 5% Ni reduces the total C. Thus Ni reduces chill, while Cr increases it. From 0.15 to 3% Ni refines the grain. Ni prevents the formation of a cementite network by Cr. It increases the hardness of the Fe, not by an increase of combined C, but by making the pearlite more sorbitic. Machinability is also improved. With C above 0.5% the strength is increased by Ni alone, as is always the case with Ni and Cr. In high-Si irons, Cr should be added with Ni to increase the strength. The deflection and toughness are improved by Ni. The shrinkage and fluidity ordinarily are not affected. Resistance to scaling at high temp., and to corrosion is conferred by addns. of Ni and Cr. Martensitic hardness is obtained with 5 to 12% Ni, and with over 15% the Fe is austenitic, tough and resistant to corrosion.
G. F. C.

Cementation of ferrous alloys by means of tungsten. J. LAISSUS. *Compt. rend.* **182,** 465–7(1926); cf. *C. A.* **20,** 567.—An ordinary case-hardening steel (C 0.15%) was cemented by means of finely powd. Fe-W contg. 0.54% C and 81.52% W. Micrographic examn. revealed the presence of an inner zone of solid soln. (disappearance of pearlite), clearly visible in the case of prolonged cementation (10 hrs.), and of a brilliant, external layer, probably consisting of W carbide, the thickness of which increases with both time and temp. The line of demarcation of the 2 zones is not as clear as in the case of cementation with Cr; but on the other hand the external layer is formed at temps. as low as 800°. The thickness of the cemented layer decreases with increase in C content of the Fe or steel. Gray Fe can be cemented, the external layer showing zones where the graphite has been partially dissolved. Corrosion tests on extra-mild steel cemented 10 hrs. at 1100° showed: relatively slight formation of oxide when immersed in H_2O, very rapid corrosion in HNO_3 (19° Bé.), very slow corrosion in H_2SO_4 (33° Bé.); in 1:1 HCl the corrosion is slower than with the uncemented steel. Steel cemented with W takes a specular polish similar to that of Ni. Also in *Rev. métal.* **23,** 233–42(1926).
A. P.-C.

Magnetic properties of permalloy. D. BINNIE. *J. Roy. Tech. Coll., Glasgow* [2] **1925,** 5–7.—The initial permeability of annealed permalloy (78.5% Ni, 21.5% Fe) is 30 times that of the best soft Fe and a field as low as that of the earth will sat. the alloy to a magnetic intensity comparable with that of soft Fe. The magnetic properties are, however, very sensitive to strain, which causes a marked diminution of the susceptibility. Thus, a thin strip of permalloy after coiling and uncoiling exhibited magnetic properties similar to those of steel.
B. C. A.

Magnetic transformations of ferromagnetic metals. R. RUER AND K. BODE. *Stahl u. Eisen* **45,** 1184–9(1925).—Expts. were made with a view to find a fixed point between 700° and 800° for the purpose of calibrating thermocouples. Three cooling curves and one heating curve for electrolytic Fe are given which show an arrest point at 769°. Electrolytic Fe from the Langbein-Pfanhauser works showed the point at the same temp. Kahlbaum Fe in rods gave the point on heating but not on cooling and gave results midway between those for electrolytic Fe and mild steel. The arrest is suppressed by impurities, but the impurity which is effective has not been identified. The heat set free at the β–α change is $^1/_6$ that at the γ–β change, or about 1 cal. per g. The change, which must be truly polymorphic, also occurs in Ni and Co. As α- and β-Fe have the same space lattice a polymorphic change does not necessarily involve a change in the space lattice, and the inverse must also be true.
B. C. A.

Self-magnetization of steel under torsion. R. CAZAUD. *Compt. rend.* **182,** 467–8 (1926).—Test bars 250 mm. long by 7 mm. in diam. under a const. tensile load of 45 kg. were placed in the magnetic field of a coil with 1 primary and 2 distinct secondary circuits, one of which was connected to a galvanometer to record the rate of variation of the flux and the other to a Grassot fluxmeter. The deviations of both instruments were recorded photographically. With const. primary current, torsional deformations cause variations in the magnetic flux, and consequently an induced current. By simultaneously recording the torsion couple, the magnetic flux and the rate of variation of the latter as functions of time (the rate of torsion being kept const.) a series of diagrams was obtained which are characteristic of the various steels tested. Under given exptl. conditions, a given type of steel always gives the same diagram, which C. considers could be used as a rapid method of indicating the compn. and heat treatment of steels. A. PAPINEAU-COUTURE

The constitution of iron-silicon alloys. G PHRAGMÉN. *J. Iron Steel Inst* **1926** (advance proof), 8 pp —An x-ray and micrographic examn. is made of alloys prepd. from electrolytic Fe and Si, the latter contg. 0.15% Al. X-ray photograms and photomicrographs indicate the intermediary phases ϵ (corresponding approx. to the formula FeSi (33 5% Si)) and ζ (corresponding to the formula $FeSi_2$ (50.2% Si)). The phase ϵ crystallizes in tetrahedra, with 8 atoms in the elementary cube, and the ζ phase in tetragonal plates with 3 atoms in the elementary parallelepiped. It is concluded from the x-ray photograms that in the α-Fe lattice the Si atoms replace the Fe atoms, the replacing atoms forming a face-centered cubic lattice with a parameter double that of the α-Fe lattice. Si raises the α-γ and lowers the γ-δ transformation points, the presence of more than 3.5% Si causing the γ-range to disappear and the α- and δ-ranges to unite. This is shown in an equil diagram, from which it is also seen that the range of the pure ϵ-, ζ- and η-phases is very narrow. The existence of the 3 eutectics is shown in the photomicrographs. It is difficult to obtain the θ-phase in a homogeneous condition, no reliable detn of its compn. having as yet been made. Quenching expts. indicate its formation at 1000°. Also in *Engineering* **122,** 369–71(1926). H. STOERTZ

Allotropy of iron. F. WEVER. *Stahl u. Eisen* **45,** 1208–10(1925).—A historical summary of work on the nature of the allotropy of iron. Westgren established by x-ray methods that there are only 2 polymorphic phases of Fe, the cubic space-centered lattice below 900° and above 1400°, and the cubic face-centered lattice between these temps. Measurements of magnetic susceptibility and thermoelec. potential have confirmed the similarity in cryst structure of the α- and δ-phases. The elements alloying with Fe may be divided into 2 classes, those increasing the stability of the face-centered γ-lattice, such as C, Ni and Mn, and those increasing that of the space-centered α-phase, such as Sn, Si, W and Mo. B. C. A.

Oxygen in iron. P. OBERHOFFER. *Stahl u. Eisen* **45,** 1341–8, 1379–84(1925).—A comprehensive study of the effect of O on Fe and steel. Steel is rendered more sensitive to overheating by the presence of O. The O becomes assocd. with the element, the oxide of which has the lowest dissocn. pressure. The oxides of Fe previous to the deoxidation process are heterogeneous. A study of the relation between the rate of O supply, rate of refining and rate of heat supply in the converter and open-hearth processes indicates the importance of improved control of the air supply. A comparison of results obtained by the H, heat extn. (cf. Goerens, *C. A.* **5,** 854) and Br processes (cf. Wust and Kirpach, *C. A.* **16,** 4156) on 9 synthetic irons and 14 steels is given. The last 2 methods enable the changes in form of the O compds. after various metallurgical treatments to be shown. A greater O content was found in acid than in basic open-hearth steel. Flaky fracture of a saw steel and red shortness of a Ni-Cr case-hardening steel were associated with high O content. Photomicrographs are given showing the effect of O in balling-up the cementite network of cemented Fe, the coarsening of the structure of annealed eutectic steel, and the formation of troostite spots on quenching. A case-hardening steel low in O showed a higher impact resistance but a greater temper brittleness than steel high in O. B. C. A.

The effect of annealing upon the hardness of cold-worked ingot iron. C. Y. CLAYTON. *Trans. Am. Inst. Mining Met. Eng.* Feb., **1926,** No. 1558-C, 3 pp.—Tests were made upon Vismera Fe contg. 0.03% C. One-half in. stock was cut in $^3/_4$ in. l. cylinders and 7 series were prepd., each series being compressed for 60 sec. in a Riehlé machine, the load being increased from 10,000 lb. in series 1 to 40,000 lb. in series 7. After compression the length was 0.693 in. in series 1 and 0.311 in. in series 7. In each series there were 17 specimens, 1 being held for study in the cold-worked condition and the others annealed for $^1/_2$ hr. at temp. ranging from 250° to 1000°, in increments of 50°. After annealing, *Brinell* and *Rockwell hardness* tests were made, the results for

each series being plotted against annealing temp. for the Rockwell tests. Cold compressed Fe, regardless of the amt. of cold work, hardens upon being annealed at a temp. between 250° and 425°. At 250°, Rockwell hardness is 70 7 at 10,000 lb. compression, 80.5 at 15,000 lb , 83.2 at 20,000 lb., 88.6 at 25,000 lb., 87.2 at 30,000 lb., 91.2 at 35,000 lb. and 89.9 at 40,000 lb. Samples compressed under loads of 20,000 to 40,000 lb. soften upon being annealed between 500° and 600°. At 550°, Rockwell hardness is 75.8 at 20,000 lb., 72.5 at 30,000 lb., 77.9 at 35,000 lb. and 83.6 at 40,000 lb. H. S.

Rational use of case-hardening compounds: practical results of systematic case-hardening tests. J. HÉBERT. *Technique moderne* **18,** 481–91, 525–32(1926).—After a general discussion of the mechanism of the action of the various classes of case-hardening compds., H. gives the results obtained in the course of tests (the technic of which is described) with wood charcoal alone, with 90:10 mixts of charcoal and various other substances, and with 80.20 mixts. of charcoal and the same substances. Contrary to the observations of some authors, charcoal alone case-hardens to a degree which increases with the temp ; the rate of variation in the C content from the surface to the center of the treated piece decreases with increase in time of treatment and increases with decrease in case-hardening temp. Treatment at 950° for 3 hrs. gave a penetration of 1.40 mm., and a highly carburized layer 0.67 mm. thick, of which 0 45 mm consisted of pearlite and cementite and 0.22 mm. was pure pearlite. Addn of 10% *NaCl* retarded carburization, but the latter remained a function of the temp. For a given temp. the rate of variation of the C content from the surface to the core is independent of the time of treatment; and with a given time of treatment is lower above than below 850°. No free cementite was observed in the most highly carburized zones. Addn of 10% *Na_2CO_3* retarded carburization, but to a less degree than NaCl. The other observations were the same as those for NaCl The effects of the addn. of 10% *$K_4Fe(CN)_6$* are felt even at 750°, at which a layer of pearlite 0.15 mm. thick was observed, but the effect decreases as the case-hardening temp. increases; so that it is suitable as an accelerator for rapid treatment at lower temps. than the preceding compds. When used at 900–950° the most highly carburized layer contains free cementite, which makes the piece brittle and causes it to scale. Addn. of 10% *rosin* acts as an accelerator only at 800–900° and is useful for rapid case-hardening at these temps. At 850° the pearlite layer was 0 35 mm. thick, as compared with a max. of 0 25 mm. with charcoal alone. The most highly carburized layer contained no free cementite. The effect of the addn. of 10% *$BaCO_3$* is felt only toward 950° and is mainly a function of the time of treatment. It increases, proportionally to the time, both the total depth of penetration and the thickness of the most highly carburized layer. As the proportion of $BaCO_3$ increases the free cementite content of the outer layer increases also, and the proportion of $BaCO_3$ and time of treatment should be chosen so as to reduce the free cementite to a min. At 750–900° addn. of 10% *NH_4Cl* has the same retarding effect as the same proportion of NaCl. At 900–950° it acts as an accelerator, progressively increasing both the total depth of penetration and the thickness of the outer most highly carburized layer. Its effect, as a function of time, reaches a max. and then decreases. There is no free cementite in the outer layer. At low temps. *pulverized bone* acts as a retarder, and from about 850° as an accelerator The outer eutectic layer is thinner than that obtained with charcoal alone, while the hypoeutectic layer is thicker. At the optimum temp. of 950° the accelerating effects begin to fall off at the end of 2 hrs. and are completely finished at the end of the 3rd hr At 950° at the end of 3 hrs. the total depth of penetration and relative thicknesses of the various zones are the same as those obtained with charcoal alone. *Carbonized leather* has an accelerating effect which, at 950°, is completely lost after 3 hrs. After 3 hrs. at 950° the zone of max. carburization is always smaller than with charcoal alone. The accelerating effects are greatest at 750–850° and increase the total depth of penetration, but the outer eutectic zone is not as deep as that obtained with charcoal alone under the same conditions. *Bone-black* acts as a retarder, and in its presence the depth of the outer eutectic layer remains const regardless of the time of treatment, while the variation in the total depth of penetration is the same as with charcoal alone. *$NaHCO_3$* acts as accelerator, especially during the 1st hr., and its action has fallen to 0 at the end of the 3rd hr It is more advantageous than the same quantity of Na_2CO_3 as regards total depth of penetration. In all the preceding cases on leaving a space at the top of the box both the total depth of penetration and the thickness of the outer pearlitic zone were greater than when the box was completely filled with the case-hardening compd. With 20% instead of 10%, NaCl and $K_4Fe(CN)_6$ increased the depth of penetration, especially NaCl; carbonized leather, pulverized bone and bone-black increased the outer eutectic or hypereutectic layer, though the first 2 actually gave lower total penetrations; rosin, $BaCO_3$ and

NH_4Cl reduced both the total depth of penetration and the outer zone of max. carburization. From a discussion of the compn. and distribution of the various zones formed on case-hardening, H. shows the importance of avoiding the formation of an outer hypereutectic, of obtaining a sufficiently thick outer eutectic zone, and an inner, transition hypoeutectic zone which shall be thick enough to reduce to a min. the danger of fissuring on quenching. The formation of a hypereutectic outer zone can be prevented by carrying out the treatment in 2 stages, first at 900–950° till the depth of penetration is about 50–75% of that which is required, and then completing at about 760–80°. Some steels are refractory to case-hardening, generally because of improper deoxidation. After repeated heating (usually 3 or 4 times) in the presence of the case-hardening compd. they respond to the treatment. A. Papineau-Couture

Cementation of iron, nickel and cobalt by means of boron. Feszczenko-Czopowsk. *Trav. ac. mines Cracovie* **1925**, No. 5; *Rev. métal.* **23** (Extraits), 267–8(1926).—Tests were carried out with amorphous B, prepd by Moisson's process, on "normal" mild steel (see Ehn, *C. A.* **16,** 2291–2) (0.075% C), "abnormal" mild steel (C 0.115%, O 0.197%), hypoeutectic steel (C 0 4%), hypereutectic steel (C 0 95%), Ni, Co, Ni steels (5 and 25% Ni), Ni-Cr steels (Cr 0 5, Ni 2.5; Cr 1.12, Ni 4 2%). Treatment was carried out at 900–1100°, for 1–16 hrs, preferably in H or *in vacuo*, but at times in other gases. The thickness of the cemented layers was measured at room temp., on unetched sections, under a magnification of 50–150 diameters Boronization does not take place in the atm. In gases contg. C cementation by C and by B takes place simultaneously. Boronization was highly successful in H, and still better *in vacuo*. The first sign of successful boronization is the appearance of "boride," or more correctly of the satd. solid soln. of B in α-Fe. Boronization of Fe and steel progresses very irregularly, the thickness of the cemented layer usually increases with temp. up to 1000°, above which there is a sharp increase. Appearance of B in hypereutectic steels begins in the neighborhood of the cementite network; at high temps. the superficial layer cemented by means of B constitutes a ternary Fe-B-C alloy, which is a solid soln. of B and C in γ-Fe and is obtained by combination of the "boride" with the cementite of the network and the grains of pearlite. On cooling to room temp. the alloy assumes a eutectoid structure. It follows that it looks as though it had been decemented, *i. e.*, the quantity of free pearlite in the cemented layer decreases. The rate of diffusion of B in Fe and steel increases rapidly with the temp.; but the layer of Fe-B or of Fe-C-B obtained is so porous and adheres so loosely to the main body of metal that it easily seps. from the latter at room temp. under slight mechanical efforts (*e. g.*, by sawing, grinding, etc), so that even with great precautions and with inclusion of the mass in shellac or in Pb it was impossible in certain cases to observe regularly the porous layer This may be the cause of the unevenness and irregularity observed in the cemented layer. Signs of fusion were observed on the outside of bars which had been considerably cemented at high temps. B deoxidizes Fe, and abnormal steel (which had not been deoxidized) gives much less pronounced results than normal (deoxidized) steels. The mechanism of the diffusion of B in Fe is as follows: B dissolves in γ-Fe between 906° and 1100°; when the temp. falls along line UP_2 of the Tammann and Vogel diagram there seps. from the solid soln. of B in α-Fe crystals with B contents increasing from 0 to 0.08% as the temp. decreases from 906° to 760°. The remainder of the solid soln. of B in γ-Fe gives, at 760°, a eutectic consisting of the crystals satd. with the α solid soln. contg. 0.08% B and with the definite compd. Fe_2B. Boronization of Ni takes place at lower temp. than that of Fe, and, at a given temp., takes place more rapidly. Atm conditions have the same effect as with Fe. B is sol. in β-Ni and in α-Ni according to conditions; whence it can be stated that Giebenhausen's diagram should be corrected to include the solid soln. of B in α-Ni. The same holds true with Co which gives a crystd. solid soln. of B in α-Co, the crystals having a characteristic needle-like appearance, with the points turned in the direction in which the diffusion takes place. In both cases the eutectoid consists of the satd α-solid soln., with Ni_2B and Co_2B, resp. With stronger and deeper boronization there is formed a new easily fusible eutectic, which seems to be the one between the compds. Ni_2B and NiB of Giebenhausen's diagram. In this case the test pieces undergo fusion. Under given conditions the rate of boronization of Co is intermediate between those of Fe and Ni. Ni- and Ni-Cr-steels are more rapidly cemented with B than mild steels, and the latter in turn than steels with higher C contents. A. Papineau-Couture

The carburization and decarburization of iron. The surface decarburization of steel. Arvid Johansson and Rutger von Seth. *J. Iron Steel Inst.* **1926**(advance proof), 58 pp; *Engineering* **122,** 460–4(1926).—In an atm. of CO_2-CO the main course of the reaction is $3Fe + 2CO = Fe_3C + CO_2$. The theoretical considerations involved are

discussed, and expts. are described which were conducted to det the equil. of the reaction and establish isotherms at 1100°, 1000°, 900°, 800°, 750° and 710°, on Swedish acid Bessemer steels in which C ranges from 0.03 to 2.32%. The equil. diagram showing a comparison between the CO_2 content of the gas in equil. with the solid phases present at the temps. in question, indicates that below Ac_1 (720°) a bivariant equil. is found, with *ferrite* and *cementite* as solid phases. Above this, 2 bivariant equil. are found, given by the lines "ferrite-austenite" and "cementite-austenite," and between them an infinite no. of equil. for different % of C in the *austenite*. It is also shown by the diagram that when FeO is reduced above 900°, the Fe obtained must always contain some C, but when the reduction takes place below that temp. the product may be C-free. The C pressure of cementite does not increase with increasing temp. as quickly as that of austenite, and it therefore results that the higher the temp. the lower is the C content of austenite, where the C pressure almost amts. to that of cementite. An equal C pressure is not reached until the austenite is satd. with C A curve is given showing the relation of C pressure as a function of temp , from which it is evident that an atm. of CO and CO_2 in equil. with C is unable to carburize the Fe until about 735°, when austenite with about 0.7% C is formed The C content of the austenite is increased with rising temp , but no free cementite is formed until about 790°. Below 735°, decarburization always takes place in such an atm , clearly proving the risk of surface decarburization on annealing steel in the presence of charcoal. The equil $Fe_3C + 2H_2 = 3Fe + CH_4$ was studied. When a steel of say 0 58% C is heated for 8 hrs , the C content will decrease to 0.35%, in 16 hrs to 0 21% and in 24 hrs to 0.13% The same tests are made with Si, Mn, W, Cr, Ni and Cr-Ni steels, the Mn, Ni, W and Cr-Ni steels showing about the same tendency to carburize as the pure C steels The Si steel shows stronger decarburization, and the Cr steel considerably less The stainless steel (14 0% Cr) decarburized in 16 hrs from 0 42% C down to 0 37% C. The decarburization increases very quickly above 650° to 700°, reaching a max. at about 950°. Above 1050° it tends to increase again. In N decarburization amounted only to 0 01 to 0.03%, attributable to the influence of gases and oxide inclusions in the steel. *Surface decarburization of steel.* Surface decarburization of steel was studied by heating test pieces in a stream of dry CO_2 and CO as well as dry air, at temps of 650°, 710°, 750°, 800°, 900° and 1100°. Two steels were used, one *hypo-eutectoid* and one *hyper-eutectoid*, contg. 0.81 and 1.11% C. Curves show the degree of decarburization as a function of gas compn. at the various temps. The hypo-eutectoid decarburizes more than the hyper-eutectoid, a somewhat stronger decarburization being obtained in air than in CO_2 and CO. At 750°, 710° and 650°, no decarburization takes place on heating in air. H. Stoertz

Gray iron castings for special needs. H. J. Young. *J West Scot. Iron Steel Inst.* **33**, 56–61 (1926) —A brief summary of current British practice is given. The unreliability of pin-point photographs for the purpose of ascertaining the homogeneity of the cast metal and the means of securing it are discussed. The latter is dependent upon control of the cooling conditions. Too much stress has been placed on pearlitic structure and too little upon homogeneity. The cooling rates of irons are dependent upon compn., mass and casting-thickness in attaining homogeneity. The Diefenthaler and Perlit procedures are outlined and the importance of grain structure is emphasized. Corrosion tests with 0.01 *N* HCl and with sea water show that corrosion is not affected by variation of total C between 3.0 and 3.6%, or by S between 0 09 and 0.25% or by Mn between 0.4 and 1.0%. It is hastened by increase in P or Si and by decrease of grain size. Expts where grain size alone varied proved that the greater the casting thickness the less is the corrosion. W. H. Boynton

Shrinkage of malleable cast iron. E. Schüz. *Stahl u. Eisen* **45**, 1189–95 (1925).—Expts. were carried out on malleable cast Fe made in the open-hearth furnace, the C and S contents being much lower than in cupola Fe. The shrinkage was measured between conical points cast on the test bars. White-heart cast Fe contracted approx. 1.93%, and the mean shrinkage for black-heart cast Fe was 1.89%. Thin-walled castings shrank somewhat more and thick-walled castings slightly less. The somewhat greater shrinkage of white-heart compared with the black-heart cast Fe was due to the greater C content, but the differences are too small to be of importance in practice. The effect of Si up to 3 3% was negligible on the shrinkage of pearlitic and hyper-pearlitic cast Fe. The white-heart castings were annealed at 1000–1050° in Fe ore and the black-heart castings at 850–870° in a neutral medium. Annealed thin-walled white-heart shrank about 2%; thick-walled white-heart and thin-walled black-heart had the same shrinkage of approx. 1.5% and thick-walled black-heart castings about 1%. The macrostructures of these types of casting are illustrated. The shrinkage is less the more temper C the casting contains, and greater the more the casting is decarburized.

Variations in the shrinkage are due to the C content and its form in the annealed casting. The shrinkage may be artificially influenced by long or short annealing according to the wall thickness. Short, thin-walled castings may be corrected by weak annealing and long castings shortened by strong annealing. B. C. A.

Influence of temperature on graphite formation in pig- and cast iron. E. Piwowarsky. *Stahl u. Eisen* **45,** 1455–61(1925); cf. *C. A.* **20,** 1204.—White Swedish charcoal pig Fe, to which pure electrode C was added, was heated in crucibles out of contact with air to various temps. up to 1800°, cooled to 20–30° below the eutectic change point, and quenched in water. The carbide-C content increased up to a heating temp. of about 1500°, but higher heating temps. favored graphite formation. Swedish pig Fe heated without the addn. of C up to 1650° also gave a max. carbide content for a heating temp. of 1500°. Below 1500° annealing had the same effect as a rise of temp. Swedish pig Fe with 2.4% Si showed a max. carbide content on heating to 1400°, and the effect of the period of heating was the same as above. As the heating temp. was raised the irons showed at first a decreasing tendency, then an increasing one to solidify gray. The co-existence is inferred of 2 kinds of mols. in the fluid Fe—the carbide and mol. C arrangements, resp., between which equil. conditions only set in after a long period of heating. In the temp. range investigated the heat of formation of Fe carbide is first negative (1150–1500°), passes through zero (1500–1550°), and then becomes positive (1550–1650°). On the Fe becoming molten both the Fe carbide and the elementary C present go into soln., but the C tends to change into the carbide mol. arrangement. To test the sluggishness of the mol. transformation the Fe with 2.4% Si was heated to 1600°, cooled to 1400°, and maintained at that temp. for different periods. The combined C content increased with the time, but at 1200° hardly any effect was observed. The views developed from the work are used to explain a no. of debatable results quoted from literature and practice. B. C. A.

Low-carbon cast iron as a cupola product. K. Emmel. *Stahl u. Eisen* **45,** 1466–70(1925).—The Thyssen-Emmel process allows of the production of low-C cast Fe in a normal cupola. The C and Si contents are each about 2.5%. The Fe is pearlitic, the graphite being finely distributed, and has a high tensile strength without heat treatment. The burden is standardized, but the rate of cooling of the Fe may be varied without adverse effect. The fracture is uniform over thin and thick sections, and piping is absent even at difficult changes of section. The density of the structure enables the castings to resist high pressure and wear, and the Fe is suitable for vessels contg. acids and alkalies. The time required for producing malleable Fe from white Fe made by this process is shortened. Photomicrographs are given of Fe annealed for 13 and 20 hrs., and having tensile strengths of 34.6 and 41–56 kg./sq. mm., resp., with elongations of 2.5% and 1.4–1.8%. B. C. A.

How phosphorus influences carbon in cast iron. J. T. MacKenzie. *Foundry* **54,** 681–4(1926).—The results of Stead, Wust and Coe are compared with the author's, showing that increasing P involves lower C in cast Fe. Some results of mech. tests show that the deflection at a given load increases with the C plus $^1/_4$ the Si content, and also with the P content G. F. C.

Improve gray iron properties by heat treatment. (I.) (II.) O. W. Potter. *Am. Foundrymen's Assn.* Oct., **1925;** *Foundry* **54,** 633–7, 678–80(1926).—Fe castings are often annealed to facilitate machining and prevent warping. P. reports numerous transverse, impact and growth tests on heat-treated cast-Fe and semi-steel. The latter, with 15 to 25% steel in the charge, had less total C than the gray Fe. Heat-treatment other than quenching reduced the combined C. Thermal analyses showed the crit. point to depend on the combined C and the Si, the Mn being less important. An av. value was 735°, but with high Si it was higher. The elastic limit in transverse tests was very low. Heat treatment reduced the transverse strength. Bars $^1/_2$ in. in diam. gave more uniform results and a higher modulus of rupture than the standard $1^1/_4$ in. bars. Tensile tests showed greater strength but less elongation for the semi-steel than for the gray Fe. Some of the quenched specimens showed improved impact values. Quenching from above the crit. point caused hardening, from below, softening and shrinkage due to contraction of the graphite. Annealing caused growth; if followed by rapid cooling in air, the growth was less with higher contents of Si and C, but if the cooling was slow the reverse was true. G. F. C.

Growth of gray iron. P. Oberhoffer and E. Piwowarsky. *Stahl u. Eisen* **45,** 1173–8(1925).—Dilatometric measurements made on a 1.75% C steel showed the α/γ contraction, followed by a continuous dilatation caused by the soln. of the secondary cementite. A white Fe with 4.3% C showed the same characteristics except that on the first heating discrepancies were caused by the release of casting strains. Cast Fe

with higher C content showed an irreversible expansion due to carbide disintegration after the first or second heating, the disintegration occurring at lower temp. as the C and especially the Si was increased. Cast Fe with 4.82% C and 1.92% Si, free from hyper-pearlitic cementite, showed no anomaly on tempering, but an increasing irreversible dilatation on heating and cooling through the A_1 point. A 4.01% C iron cast in chill showed no carbide disintegration, but with an addn. of 1% Si the effects at Ac and Ar decreased with increasing no. of heatings and coolings, the dilatation of Ar_1 being always greater than the contraction at Ac_1. The same iron cast in a preheated sand mold behaved after the first heating like the white Fe The large dilatation due to disintegration of free cementite is distinct from the continuous growth, which is due to increasing disintegration of pearlitic carbide, to increasing disintegration of the structure in the sense of Kikuta's theory (*C. A.* **16,** 3848), and to increasing oxidation of the cracks and the surfaces surrounding the graphite as described by Rugan and Carpenter (*C. A.* **5,** 1053). The influence of the occluded gases on growth is doubtful. Growth below the A_1 point, especially in irons high in Si, is due to the slow disintegration of the carbide in combination with oxidation phenomena. Photomicrographs are given showing that the structures are in agreement with the dilatation expts. B. C. A.

Cast iron. RUDOLF HOHAGE *Krupp. Monatsh.* **7,** 101–9(1926) —The structure of high-C cast Fe alloys with relation to chem. compn. (Si, Mn) and thickness of the casting is investigated and the relation to the Brinell hardness is shown. The influence of heat treatment on the structure and Brinell hardness is also investigated. Photographs and curves are appended. G. DUBPERNELL

Linear velocity of pearlite formation. G. TAMMANN AND G. SIEBEL. *Stahl u. Eisen* **45,** 1202–5(1925).—C steel wires contg. from 0.23 to 0.96% C were heated and allowed to cool at different velocities. As they passed through the point of pearlite formation they "flashed up," the brightening commencing at the ends of the wire, and the velocity of the change was measured by timing the rate of propagation of the color along the wire For a given wire the velocity of the transformation remained const. until the rate of cooling had fallen to a crit. value, after which it fell off rapidly. The max. linear velocity of transformation of γ-mixed crystals to pearlite was 550 mm. per sec. The velocity rose with increasing Mn content, and above 0.85% Mn the wire glowed uniformly over the whole surface. The velocity on cooling in air was appreciably less than in H, but whether H accelerated the change or small quantities of O and Fe oxide diminished it was not detd. In a 0.64% C steel cooled in H, the velocity of deposition of α-Fe from γ-mixed crystals was 2 to 3 times greater than that of the subsequent pearlite formation. B. C. A.

Changes in the tensile properties of predominantly pearlitic steels by heat treatment. H. MEYER AND W. WESSELING. *Stahl u. Eisen* **45,** 1169–73(1925).—Although the tensile properties of pearlitic steels depend on structural changes, the latter are not easy to interpret, especially at low magnifications. In granular pearlite the grain size of the ferrite groundmass and of the cementite particles embedded therein must be considered and in lamellar pearlite both the effective and the apparent grain size. The effective grain size bears no simple relation to the grain size of the solid soln., and is not satisfactorily indicated by the customary etching reagents. Tensile and impact tests were made on 1 hypo-eutectic, 1 eutectic and 2 hyper-eutectic C steels, annealed at different temps. for 1/2 hr. and 5 hrs and slowly cooled in air or in the furnace. The temp range in which the properties of the steels were influenced by the formation of granular pearlite is greater than is generally assumed. The low max. strength and high impact test accompanying the granular pearlite structure were increasingly pronounced from the hypo- to the hyper-eutectic steels. Greater duration of heating was equiv. to a higher temp. and the cooling velocity had considerable influence. The influence of the mode of formation of the pearlite was greater than that of grain size. Coarsely lamellar pearlite showed greater toughness than the finely lamellar. The effect of increasing grain size due to rising annealing temp. was shown in the low impact values given by the test pieces slowly cooled from the higher annealing temps. This effect is accompanied by a falling value of the ratio of max. strength to ball hardness and of the ratio of yield point to max. strength. B. C. A.

Is the direct change from austenite to troostite possible? KÔTARÔ HONDA. *Iron Steel Inst* **1926** (advance proof), 4 pp.—The theory of quenching, as confirmed by x-ray analysis, involves the change: *austenite* ⟶ *martensite* ⟶ *pearlite* (*troostite*). If a steel is quenched during the process of transformation, it is found that troostite develops in a granular form from the boundary of austenite, and such a troostite is usually said to be directly produced from austenite, but this is not the case. When the

change from austenite to martensite takes place at a low temp (300°) the change proceeds slowly, and Fe atoms which change their configuration from the γ-type to the α-type, the C atoms still remaining in the interspaces of the lattice, have sufficient time to build up the characteristically needle-shaped crystals. But if the change takes place at a relatively high temp , its progress is very rapid, and as soon as the Fe atoms change their configuration from the γ- to the α-type, the pptn. of cementite takes place. In this case there is not sufficient time for the formation of the needle-shaped crystals, and granular troostite is formed from the nuclei as centers on the grain boundary of the austenite. A photomicrograph is shown. Though the crystal form is not needle-shaped, α-Fe contg C as a solid soln. may safely be called martensite As the change from austenite to troostite involves 2 changes, consisting of the change in at. configuration and of the pptn. of cementite, any change from austenite to troostite must take place through martensite. The question whether the C in martensite dissolves in α-Fe as C atoms or as cementite mols is discussed, H. concluding that the former is correct Also in *Engineering* **122**, 371-2(1926). H STOERTZ

The manufacture of low-carbon semisteel. M. HORIKIRI *Repts. Imp. Ind. Research Inst Osaka* (Japan) **7**, No. 5, 1-68(1926); cf *C. A* **20**, 2647.—A low-C semisteel having the tensile strength of 30 kg. per sq. mm. or above was made in a cupola. The presence of Si resulted in favorable action on graphitization. When the semisteel contained 3.3% or above of total C graphite formation was excellent, but when Mn content was above 1% the pearlite was almost entirely decomposed by annealing at 800° for 1 hr. and the product lost heat- and friction-resisting properties. Semisteel of a low C content (about 2.87%) retains its heat and friction-resisting properties with Mn content as low as 1% or below, but a greater amt of Mn gave greater heat and friction resisting properties with an excellent graphite formation. A study of desulfurization showed the necessity of the addition of a reasonable amt of Mn with an increase in the proportion of soft steel. An alloy contg. an extraordinarily low C content of 2.0-2 6% and a high Mn content of 3.0-6.0% was made in a large cast and was found to have an excellent structure. Numerous tables, graphs and photomicrographs are presented. NAO UYEI

The effect of phosphorus on the resistance of low-carbon steel to repeated alternating stresses. F. F. MCINTOSH AND W. L. COCKRELL. Carnegie Inst. Technology, *Mining and Metallurgical Investigations Bull.* **25**, 1-28(1925)—The purpose of this investigation was to obtain data on the effect of P in low-C steel under alternating stresses Fatigue tests were made on plain and notched specimens of 5 basic open-hearth low-C steels (contg. less than 0.15% C) whose P content varied from 0.010 to 0 125%. The P content was obtained by the addition of Fe-P in the ladle, and the results of this investigation are intended to apply to steels where the P content is added rather than residual. The fatigue-testing machines were of the Farmer rotating-beam type. The results of this investigation for the most part confirm the statement that a specimen that will run at a given stress 10 million repetitions without failure will also run 100 million or indefinitely at that stress. Detailed results of the fatigue tests are given in tables and curves. Micrographs of the carburized core and the original condition of the steel are shown. It may be said from this work and that of others referred to, that the addition of P (from 0.010 to 0.125%) to open-hearth steel contg less than 0.15% C has the following effects: (1) it increases the endurance of the material against repeated alternating stresses; (2) it increases the hardness, ultimate strength and elastic limit; (3) it has no particularly bad effect on the resistance to shock or vibratory strain; and (4) it increases the resistance to corrosion and abrasion and has no well-defined effect on ductility. A selected bibliography is included on the subjects of "Fatigue of metals" and "Effect of phosphorus in ferrous alloys." E. G. MEITER

The hardness of different structures in steel. KANZI TAMARU. *Sci. Papees Inst. Phys. Chem. Research* **5**, 25-44(1926).—Quenched steel of 1 69% C was treated in different ways to obtain various proportions of austenite and martensite, which were detd. with a planimeter from photomicrographs. The Rockwell hardness was detd. and transposed into Brinell nos., and by extrapolation of a curve the hardness of austenite was found to be 155, and that of martensite 720. The impact hardness of 0 6 and 0.8% C steels at temps. up to 866° is reported. The av. hardness of austenite in Mn steel was found to be 182. Lower C and Mn in Mn steel gave greater hardness because of the formation of martensite. Impact hardness tests of Mn steel at high temp. showed a max. at about 600°, due to blue shortness, the effect coming at a higher temp. than in static tests because of the velocity of loading. Structural changes did not explain this hardening. The hardness of martensite increased with the fineness of its needles. Tempering of 0.89% C steel around 120° caused increased hardness,

due to transformation of retained austenite into martensite, which was confirmed by dilatation and d. measurements. Further tempering caused softening due to troostite formation. The Brinell hardness of cementite was detd. to be 820 from a thin high-C chill-cast plate The above values are admitted to be too high on account of internal stresses; the natural hardness of cementite is stated to be 640, but a similarly corr. figure is not given for austenite or martensite. G. F. C.

The distribution of hardness in quenched carbon steels and quenching cracks. TSUTOM KASÉ. *Science Repts Tôhoku Imp. Univ.* **15**, 371-86(1926).—Honda's theory of the transformation of steel in cooling from austenite through martensite to pearlite is outlined, the changes due to different rates of cooling being noted. Cubes and cylinders 3 cm. long, of steels contg 0.3, 0.59, 0.89 and 1.48% C, resp., were quenched and tested for scleroscope hardness at numerous points. When quenched in water, the interior was harder, due to retention of austenite; when quenched in oil, the exterior was harder. Dipping the quenched specimens in liquid air increased the hardness, especially at the periphery, by transforming retained austenite to martensite Annealing at 100° slightly increased the hardness; softening was rapid at 300° to 450°. The effects of aging are reported, consisting usually of a slight hardening, at first rapid, then very slow. Small cubes of 0.9% C steel cracked when quenched from above 900°; larger cubes cracked only when subsequently dipped in liquid air. Cracking was worse with smaller cubes, or with higher C content. The cause of cracking was not thermal stress, but the greater sp. vol. of martensite as compared with austenite G. F. C.

Testing of hardened steel. AXEL LUNDGREN. *J. Iron Steel Inst* **1926** (advance proof), 37 pp ; *Engineering* **122**, 309-12.—Tool steel is examd for *limit of elasticity, limit of proportionality, ultimate strength*, etc , by means of bending tests, toughness or resistance to shock by means of impact tests, and hardness by means of indentation tests. Influence of various methods of annealing and of the resulting microstructures on the mechanical properties of the steel after hardening were studied Photomicrographs of each case are shown before and after hardening. Variations of stress with tempering conditions and quenching temp are discussed In all the steels the ultimate stress drops as the tempering temp. is raised, but this drop varies with the temp Approx. the same limits of proportionality and elasticity are obtained with the various quenching temps. at one tempering temp , but as this is raised the limits of proportionality and elasticity drop. With the same tempering temp., on increasing the quenching temp. the impact resistance of all steels is reduced. This reduction is greater at higher tempering temp. Curves are shown. The difference in ultimate stress between 2 steels is greatest when the hardness is greatest, and decreases when the hardness decreases. With a hardness of 57 to 55, the 2 steels show the same ultimate stress. H. STOERTZ

The mechanical properties of four heat-treated spring steels. G. A. HANKINS, D HANSON AND G. W. FORD. *J. Iron Steel Inst.* **1926** (advance proof), 26 pp.—The steels investigated are those most frequently used in the manuf of laminated springs, and include a 0.6% C steel (1), a 0.8% C steel (2), a silico-Mn steel (3), and a chrome-V steel (4). After preliminary hardness tests, the following heat treatment was adopted, in each case followed by mech tests. Steel 1 was oil-quenched from 950° and tempered at 400°, 450°, 500° and 550°. The structure as oil hardened from 950° was mainly martensitic with a little *troostite* present; tempered at 550°, no troostite was evident in the photomicrograph. Steel 2 was oil-quenched from 900° and tempered at 500° and 550°. The normalized material consisted entirely of *pearlite;* quenching produced a sorbitic structure little affected by tempering Steel 3 was oil-quenched from 950° and tempered at 450°, 500°, 550° and 600°, and H_2O-quenched from 870° and tempered as above. Steel 4 was oil-quenched from 850° and tempered at 400°, 475°, 550° and 600°. The microstructures were extremely fine; normalized material from 850° gave a *martensitic structure.* Results are given for all samples of *tensile, rotating cantilever fatigue, Izod impact,* and complete *torsion* tests. H. STOERTZ

Periodical heat treatment. H. C. H. CARPENTER, *et al.* *Dept. Sci. Ind. Research 2nd Rept. Gas Cylinders Research Comm.* **1926**, 29 pp.—Steels (0.25% and 0.45% C) were re-annealed and re-normalized; there was a tendency to form ferrite and globular carbide instead of ferrite and lamellar pearlite. This lessens the ultimate strength and increases the brittleness. Mech. tests and examn. of the micro-structure show that re-normalizing has no deleterious effects but appears to relieve the effects of over-strain and to leave the material practically as in the normalized rolled bar. Exptl. results and the micro-examn. on the effect of a final normalizing treatment on specimens repeatedly annealed after overstrain show that the material is restored to its original state. The low-C steel used approximates the material used in British high-pressure

gas container manuf. and the annealing treatment is similar to that employed for periodic re-annealing of gas cylinders, except in the time of heating at 650° which in the case of cylinders is much longer than the 2 hrs. of the tests. Results indicate that a single normalizing operation after manuf. should be sufficient, and that re-annealing is unnecessary. Results on tests to detect any embrittling effect on the steel due to repeated hammering upon the surface indicate no deleterious effects either with or without subsequent heat treatment of the usual kind. Results are tabulated and photomicrographs are shown. W. H. BOYNTON

Nature of high-speed steels. E. MAURER AND G. SCHILLING. *Stahl u. Eisen* **45,** 1152–69(1925).—The materials examd. included 2 types of high-speed steel with high and low alloy content, resp., and a series of steels contg. W, Cr and V, resp., in comparison with 2 C steels contg. 0.71 and 1.46% C. Ball hardness tests were made on the various steels in the quenched condition and when tempered up to 700°, and photomicrographs are given of their structure. The microstructure of all the special steels was martensitic, no γ-iron being found except in the C steels. The 2 high-speed steels were still martensitic at the tempering temp. corresponding with the max. hardness. The hardness curves could not, however, in general be explained by the microstructure. Curves are given showing the effect of tempering on the magnetic remanence, induction and coercive force of the steels. The curves for the C and high-speed steels may be considered as limiting types with large deflections in characteristic temp. ranges, and between which the curves for the other alloy steels lie. Measurements of the elec. resistance of the tempered steels were also taken, the curves being similar to those for coercive force, and confirming the conclusion on chem. grounds that in the annealed condition of high-speed steels, the Cr is mainly in the ground-mass. They indicated that the fall in hardness before the appearance of secondary hardness was due to the partial reconversion of the dissolved special carbides and not to the liberation of hardness strains. In C steels no such fall in hardness occurs. No connection was found between cutting power and the tempering phenomenon. In the sense used by Osmond there is no basic difference between the hardness of C and high-speed steels, but no explanation is offered of "red hardness." Softening only at a high tempering temp. is a necessary but not a sufficient condition for a high-speed steel, the retention of a cutting edge being due to some additional property. Differential heating curves showed 2 deflections corresponding in some degree to those found in the magnetic and elec. measurements but throwing no light on the hardness changes on tempering. The assumption that the first deflection is connected with the Fe carbide and the second with the special carbides is not supported. Dilatation curves indicated that a part of the γ-Fe present at high temps. remains after quenching. It is thought that this γ-Fe causes the phenomenon of secondary hardness on tempering, as the curves clearly show that the γ-α-Fe change occurs before the re-deposition of the Fe carbide and special carbides. The dilatation curves also showed that the presence of Cr and V increased the intensity of the crit. change of pure W steels at high temps. Hence, in a high-speed steel there is an increased amt. of γ-Fe which is capable of dissolving the special carbides in greater quantities, whereby an effective hardness in the sense used by Maurer (*C. A.* **16,** 3296) is obtained on quenching. The assumption that the effect of Cr is to increase the soly. of W was verified. B. C. A.

How to treat manganese steel. BIRGER EGEBERG. *Iron Age* **118,** 676–8(1926).—Cast and forged Mn steel are discussed. The relatively high losses in casting, the heat treatment of austenitic steel, phys. properties, and possible uses of cast, forged and rolled Mn steels are given. W. H. BOYNTON

The silvery oval spots in certain transverse failures of rails. CH. FREMONT. *Génie civil* **87,** 349–51(1925).—Oval spots are the result of an interior fissure caused by inclusions, nuclei of segregation and various impurities, all weakening the rail on a transverse plane. The fissure progresses due to repeated shocks which put the metal in tension in that part of the railhead situated above the tie. J. J. H., JR.

Physical investigation into the cause of temper-brittleness. J. H. ANDREW AND H. A. DICKIE. *J. Iron and Steel Inst.* Aug. **1926** (advance proof), 38 pp.—Sp. vol. and Brinell hardness detns. were made on various C and alloy steels with heat treatment varied to give tough, brittle and intermediate states. Variations are produced in these characteristic properties depending on the rate of cooling from the tempering temps. In steels susceptible to temper brittleness a moderate cooling rate (2–3°/min.) produces a marked decrease in sp. vol. and hardness as compared with the quenched material; the magnitude of this change is proportional to the degree of brittleness produced by very slow cooling. As the cooling rate is decreased still further the sp. vol. and hardness rise to approx. the water-quenched value. To account for these changes the theory

is advanced that ferrite may at higher tempering temp dissolve an appreciable amt. of carbide, which on quenching is retained in solid soln., while with slower cooling re-deposition results. Ni, Mn, Cr and P tend to increase the soly. of carbide in ferrite and also its re-deposition while Mo tends to retain the carbide in solid soln. irrespective of the cooling rate. With the aid of supplementary microscopic evidence the authors conclude that very slow cooling rates lead to re-deposition of carbide at the grain boundaries, resulting in a brittle network. Globularization of carbide in Ni steels is considered in its relation to the above changes R. H. ABORN

Anomalies in heat conduction as investigated in spherical steel specimens with some determinations of thermal and electrical conductivities in iron and carbon steels. C. BENEDICKS, H. BACKSTROM AND P SEDERHOLM. *J. Iron and Steel Inst.* Aug. **1926** (advance proof), 46 pp.—A method was successfully worked out for the accurate detn. of small temp. differences. By this method local variations in temp differences reaching a max. of 850% were found in centrally heated spherical specimens. These variations were confirmed by thermoscopic, thermal cond and elec resitivity measurements though these were considerably smaller The macro- and microstructures also showed some variations though not significant in every case Thus the apparent heat cond. of a metal must depend to a large extent on thermoelec convection currents, which are more effective the greater the mass and result in a higher relative heat transfer In the detn. of thermal cond λ of steels the best method involved the use of a cylindrical specimen elec. heated at one end and cooled at the other end, having a guard tube heated similarly to prevent external heat losses. For comparison the elec resistivity σ was also detd. The changes in σ of hardened specimens occurring during 26 years are given. The connection between thermal and elec. resistivities is close but does not correspond to a const $\lambda\sigma$. The thermal resistivity of C steel may be expressed by $1/\lambda = 4.4 + 8.7\Sigma C$, where λ is expressed in cal./cm sec. Grade and ΣC = carbon value in wt % of added elements dissolved in Fe. The theoretical value of λ for pure Fe is thus 0.227, which is 20% higher than the highest experimentally obtained value. Too much reliance should not be placed on λ values as they are not independent of specimen dimensions. The effect on λ of added dissolved elements increases in the following order—Ni, Mn, hardening C, Al, Si, while cementite C exerts only a slight influence. R. H. ABORN

The treatment of steel with ferro-carbon-titanium. G. F. COMSTOCK. *J. Iron Steel Inst* **1926** (advance proof), 9 pp — A discussion of the practical results obtained by the use of ferro-C-Ti in the treatment of steel. The alloy contains about 17% Ti and 7.5% C, and while lb for lb it has less deoxidizing capacity than 50% Fe-Si, in view of the stronger affinity of Ti for O, its use as a final addn results in a more complete deoxidation of the steel Some heats of basic open-hearth steel were run to det. the effect of treating effervescing steel with Ti, with and without Si pig in the furnace, and to study the effect of Ti on killing in the ladle The Ti-treated effervescing steel was the cleanest of these steels, while the Ti treated killed steel showed the most uniform structure, as was also indicated with S prints, but showed only a slight increase in cleanness over the steel killed with Si in the ladle. Ti also tends to lower the N content of steel. The amt. of the Fe-C-Ti alloy used as a deoxidizer in the ladle generally varies from 1 to 4 lbs. per ton of steel The fluxing action of TiO_2 on the furnace slag is also an advantage. The O content of rail steel has been decreased from 0.0048% to zero as the addn. of Fe-C-Ti was increased from zero to 10 or 12 lbs. per ton Finer sulfide inclusions and a less streaky microstructure are characteristic of Ti-treated killed steel, permitting of easier attainment of grain refinement. Used in place of Al for final deoxidation in sand castings, Ti produces improved ductility. H STOERTZ

The specific heat of carbon steels. SABURO UMINO. *Science Repts. Tôhoku Imp. Univ* **15**, 331–69(1926).—To det the sp. heats of steels contg. 0.09–2.84% C at 100° to 1250°, and their heats of transformation, specimens 10 mm. in diam. and 30 mm. long were dropped into a calorimeter from an elec. furnace with H atm., and the rise in temp. was noted. The results are tabulated and shown by curves. The sp. heat of pure Fe, obtained by extrapolation of curves, increased with rise of temp. below A_3, but was const. at higher temp. Steel showed another change in sp heat at the A_1 point. Below this point the sp. heat showed a slight linear variation with the C content. The heat of soln. of 1 g. C in Fe was 1760 cal. This effect was max. with 0.9% C in the steel. The sp. heat of C was studied with electrodes contg. 98% C, and increased linearly up to 700° and less rapidly at higher temp. The sp. heat of cementite was greater than that of pearlite or ferrite below 800°; all increased with rise of temp. By sp. heat detns. the A_1 transformation was shown to be a function of temp. and time, while the A_2 transformation was dependent on temp. only. The heat of transformation

of martensite to pearlite was 10.2 cal. per g. of steel contg. 0.9% C, at 850° to 1000°; that of austenite to martensite for the same steel was 5.9 cal. These heats of transformation increased with the C content below the eutectoid compn. Between the A_1 point and 1250° the sp. heat was shown to be almost independent of the C content. G. F. C.

Relation of wear [of steel] to structure. A. STADELER. *Stahl u. Eisen* **45,** 1195-8 (1925).—Wear tests were carried out on 20 C steels contg. 0.63-0.74% C, 10 specimens being in the as-rolled condition and 10 being quenched and tempered to give approx. the same ball hardness. No relation was found between the resistance to wear and the chem. compn. or the mech. properties. The heat-treated steels showed 40% less wear on the av. than the rolled specimens, but the best of the latter were about equal to the worst of the former. Metallographic examn. showed a fine or medium ferrite network in the rolled steels and a coarser network in the heat-treated steels. In the former there are more ferrite particles in the bearing surface, which are compressed and squeezed out of the harder network, resulting in greater wear than in the coarser-grained steels. B. C. A.

Specific volume determinations of carbon and chromium steels. J. H. ANDREW, M. S. FISHER AND J. M. ROBERTSON. *J. Roy. Tech. Coll.* (*Glasgow*) **2,** 70-8(1925); cf. *C. A.* **19,** 28.—The sp. vol. of steels contg. up to 1.2% C increases as the temp. of quenching is raised to an extent which is greater the higher the C content. This is evidently due to expansion of the martensite. With more than 1.2% C austenite is produced in amts. which increase with rise of quenching temp. so that the sp. vol. of the steel begins to decrease again. This decrease is most marked after quenching from 1100°. If, however, the same steels are heated to 1100° for a short time, allowed to cool to 1000-800°, and then quenched, the sp. vols. are extraordinarily high, possibly because of graphitization having taken place. The increase in sp. vol. on quenching indicates that martensite is a solid soln. of cementite in ferrite in which the Fe lattice has been expanded by C and that the amt. of this expansion produced by a definite quantity of C in soln. exceeds the vol. of the corresponding quantity of cementite. The sp. vol. curves for Cr steels are similar to those for plain C steels. The effect of tempering Cr steels with more than 1% C is first to reduce slightly the sp. vol., then between 200° and 300° to cause it to increase rapidly, corresponding with the tempering of the austenite; above 300° simultaneous tempering of austenite and martensite results in a decrease in the sp. vol. With a low-C Cr steel a steady fall in the sp. vol. takes place with rise in temp. of tempering. Austenitic C steels with or without Cr increase in sp. vol. after immersion in liquid air although the elec. properties remain unchanged. B. C. A.

Influence of treatment on the impact resistance of [iron and steel] chain materials at low temperatures. A. POMP. *Stahl u. Eisen* **45,** 1180-4(1925).—Impact tests were carried out on specimens of wrought iron, mild steel and soft iron in the as-rolled, annealed, overheated, cold-worked and heat-treated conditions over a temp. range of −70° to 100°. Annealing at 920° coarsened the ferrite grains and small pearlite areas and heating to 1200° greatly increased the grain size. Cold rolling produced no appreciable change in structure, but heat treating by quenching at 920° in water and tempering at 650° gave fine and regular grain size. The resistance to impact of the 3 irons diminished rapidly with falling temp. Wrought iron was less resistant than mild steel, and soft iron was the best of all, especially at low temp. in the heat-treated condition. All heat treatments tending to coarsen the grain size were detrimental to the impact value, the annealed specimens being less tough than in the rolled condition. Quenching and tempering removed the unfavorable brittle condition of the irons arising in the manuf. of chains and diminished the liability to fracture at low temps. B. C. A.

Silicon as an alloy in steel. H. W. GILLETT. *Iron Age* **118,** 481-2(1926).—A low C, high-Si structural steel developed in Germany and called "Freund" is discussed. It was first made in a Bosshardt high-temp. furnace, but can be made in an ordinary open-hearth. Tests showed that with 1% Si and not over 0.15% C the yield point and ductility are both high. Ni or higher Mn will give the same effect as Si, but sometimes the use of Si is cheaper. The properties of the Freund steel are summarized. The Izod value was over 56, the proportional limit over 49,000 lbs. per sq. in., and the elongation 25% in 8 in. G. F. C.

Electrochemical potentials of carbon and chromium steels. C. BENEDICKS AND R. SUNDBERG. *J. Iron Steel Inst.* **1926** (adv. proof); *Engineering* **122,** 430-1.—Two types of potentials were obtained and measured against a normal calomel electrode: (*a*) In a neutral (0.82 *N*) $FeSO_4$ soln. carefully purified from free O (E_H) and (*b*) in the same soln. in a partly oxidized state obtained by adding H_2O_2 (E_o). In all cases E was more

negative than E_o and they are influenced by addns. in opposite ways. In unquenched C steels E_H decreases with increasing % C up to 0.9, then rises slightly, while the reverse is true for E_o. In quenched C steels the difference between E_H and E_o tends to vanish with increasing % C and quenching temp. Consequently differential aeration will have little effect on high-C steel hardened from a high temp. In unquenched Cr steels E_H increases with increase in % Cr up to 8%, then decreases passing through a sharp min. at 13–14% and again increases, while E_o decreases rapidly to a const. value at $\geqq$ 8%. In quenched Cr steels E_H increases with increasing % Cr while E_o decreases. The effect of increasing C in Cr steels was also detd. as well as sp. vols. and elec. resistivity of the stainless steels. These agree with the sudden change occurring in E_H and E_o near 13% Cr—probably related to the fading out of the γ region of Fe. Photoelec. effects were observed with both stainless and C steels immersed in $FeSO_4$ soln., the phenomenon being more marked with the former than with the latter. R. H. A.

Electrochemical behavior of non-rusting steel. B. Strauss. *Stahl u. Eisen* **45**, 1198–1202(1925); cf. *C. A.* **19**, 3239.—Borchers' theory (Diss., Aachen, 1914) that passivity is due to the combination of O atoms with surface Fe atoms was tested in non-rusting Ni-Cr steels by titration with 0.01 *N* $KMnO_4$ soln. but was not substantiated and it could not be demonstrated that O was present in the metallic surface layer. Potential measurements were made on a series of alloys of Fe with Cr, Ni and C against a 0.1 *N* calomel electrode in *N*/1 $FeSO_4$ soln, and only 2 values were found for the potential, *viz*, − 0.6 v. and +0.2 v. The former value is the same as that of mild steel and the higher potential lies between the normal potentials of Cu and Ag. In a low-C Fe-Cr series the negative potential was found below 12% Cr, both values between 13 and 15% Cr, and the positive potential above 16%. In a series of steels with 13–15% Cr both values were given below 0.8% C and the negative potential for higher C contents. For steels contg. 20% Cr the positive potential was found up to about 2% C, and the negative potential above this value. In a series of steels contg 20% Cr and 7% Ni a potential of 0.2 v. was given up to 1% C and —0.6 v. above 2% C. The potential was influenced by the method of production of the alloys, their heat treatment and surface condition, their period of immersion, and whether the soln. was stirred or at rest. B. C. A.

Passivity and corrosion of iron. Leon McCulloch *Trans. Am. Electrochem. Soc.* **50** (preprint), 10 pp.(1926).—Two new instances of passivity in iron are described. Very small particles of electrolytic Fe have been found not to rust as does ordinary Fe. In a soln. of NH_4OH and NH_4Cl, Fe was found either to be corroded rapidly or else to be passive. An addn. is attempted to the current theory of the corrosion of Fe. The progressive rusting of Fe is ascribed to the "catalytic" action of sol Fe salts, which are held upon the Fe surface by the coating of rust. These sol Fe salts are a product of the electrolytic action which takes place over the surface of a metal when exposed to natural waters and air. Thus the modern electrolytic theory and the old acid theory are combined into one, but the CO_2 to which the corrosion was attributed by the old acid theory is no longer necessary, since Fe salts of stronger acids are seen to be present. C. G. F.

The influence of alternating currents on the electrolytic corrosion of iron. A. J. Allmand and R. H. D. Barklie. *Trans. Faraday Soc.* (advance proof), Feb. 22, 1926.—The corrosion of Fe in alk. soln. by d. c., a. c. and a. c. superposed on d. c. was investigated. The latter shows relatively increased corrosion. A typical sub-soil drainage liquid, satd. with CO_2, gave a similar result. Arthur Grollman

Corrosion (of pipes) by salt brines. L. Pierre. *Brasserie et malterie* **16**, 135–40, 150–7(1926).—From a discussion of the various theories of the mechanism of corrosion of coils by salt brines, P. concludes: The active corroding agent seems to be the electrolytic couple formed by air-brine-steel, so that it is important to avoid absorption of air by the brine; the activity of the couple will be proportional to the cond. of the brine, *i. e.*, to its concn.; presence of $MgCl_2$ in NaCl or $CaCl_2$ brines increases corrosion by hydrolysis with formation of free HCl; brines contg. either $MgCl_2$ or $CaCl_2$ should be neutralized with CaO or Na_2CO_3; NaCl and $CaCl_2$ brines having the same cryoscopic value have equiv. corrosive powers. A. Papineau-Couture

Corrosion of aluminum by concentrated sodium chloride solution. A. Mertens. *Bull. assoc. école sup. brasserie Louvain* **26**, 137–8(1926).—Samples of com. Al, both hard and annealed, as used for the construction of brewery tanks, were pickled with Na_2CO_3, washed, and immersed in pairs in 10% NaCl for 110 days, the relative positions of the bars in each pair being reversed after 12 and again after 67 days. Under the conditions of the tests the hard Al was corroded more rapidly than the annealed Al, the top bar corroded more rapidly than the bottom one (the latter being apparently protected

to some extent by the gelatinous deposit which is formed, while the upper one is in more intimate contact with the gases evolved), the rate of corrosion increases with time, and the corrosion was not necessarily more rapid with a mixed pair of bars (one hardened and one annealed) than when both were of the same kind of metal. A. P.-C.

Prevention of corrosion of pipe. WM. W. BRUSH. *J. Am. Water Works Assoc.* **16,** 173-80(1926).—Attention is called to the benefits of protective coatings in preventing internal corrosion of Fe pipe. The discussion brings out advantages of a cement lining. D. K. FRENCH

Tests of some rust-preventing materials suitable for the protection of stored machinery. C. JAKEMAN. *Engineering* **120,** 123-5(1925).—The protective value, against corrosion, of materials which could be applied readily to machinery by means of a brush was tested by coating plates of steel and composite test-pieces of steel and gun-metal, and exposing the coated metal to the effect of the atm., distd. water, sea water and aerated tap-water at 65°. Com prepns., which were more in the nature of paints, were not found to be as effective in preventing the formation of rust as an application of grease. A thick coating of lanolin was fairly satisfactory, but better protection was afforded by using a soln. contg. about 23% of lanolin or wool grease. The soly. of lanolin in methylated spirit, acetone, and ether was not sufficiently great to leave a good coating of grease on application of the soln. Paraffin oil, gasoline, and light petroleum dissolved lanolin in inverse proportion to the d. of the solvent, and gasoline was satisfactory except by reason of its inflammability. Benzene also proved to be a suitable solvent, dissolving 40% of its weight of lanolin. Although the coating of lanolin melted when test-pieces were exposed at 65°, no more corrosion was observed than when the steel was coated with the harder materials. B. C. A.

Corrosion of copper tubes by petroleum. E. STAUDT. *Chem.-Ztg.* **49,** 952(1925).—A spiral Cu tube surrounded by hot exhaust gas was used to preheat the petroleum for a tractor engine After carrying 40 l. per day for 15 days the tube was stopped by a gray black mass shown by analysis to be largely Cu_2S (72 56% Cu, 20% S, 5.02% C). The wall thickness had decreased by $^1/_{10}$ mm. The petroleum contained 0.10% S. Cu is concluded to be unsatisfactory for use with hot petroleum. E. L. CHAPPELL

Wood impregnation and metal corrosion. FRIEDR. MOLL. *Korrosion* **1,** 17-8 (1926).—With modern methods corrosion is not to be feared. J. H. MOORE

The welding of high-chromium alloys intended to meet extreme conditions. S. M. NORWOOD. *Trans. Am. Electrochem Soc.* **50** (preprint), 6 pp.(1926).—There are many difficulties inherent in the welding of alloys contg. more than 10% Cr. The most serious problems are those of brittleness in the weld and in the base metal adjacent to the weld, a brittleness that cannot be relieved even by heat treatment in alloys contg 20% or more of Cr. N. has overcome these obstacles by the addn. of 8% Ni to high-Cr alloys. The objection of diminished corrosion resistance to S products, generally accompanying the addn. of Ni, has been removed by an addn. of 2% Si. The presence of Mn in percentages equal to the Si improves the welding characteristics of the alloy. C. G. F.

Atomic hydrogen arc welding. R. A. WEINMAN AND I. LANGMUIR. *Gen. Elec. Rev.* **29,** 160-8(1926)—Two types of atomic H_2 arc welding torches and the circuit diagram of the app. used with them are shown. Since the striking voltage and the arc voltage are higher for an arc in H_2 than for the ordinary welding arc the present-day equipment is not suitable as a power source for the atomic H_2 torch. The results with atomic H_2 and with gas mixts. and various electrode materials are indicated. Considerable work has been done on various metals and their alloys in different forms of welding with H_2. Numerous test specimens are illus. and discussed. Highly ductile welds are procured W. H. BOYNTON

Arc welding in hydrogen and other gases. P. ALEXANDER. *Gen. Elec. Rev.* **29,** 169-74(1926).—A brief description is given of a new method of arc welding in a hydrogenated atm. The H_2 atm. is supplied around the arc by directing a jet of H_2 alongside the welding electrode. An open-circuit voltage of the generator of at least 120 v. and a high voltage drop (about 40 v) across the arc are characteristics of the welding arc. The welds are made rapidly and are much more ductile than ordinary welds. The increased speed is the result of concg. in the arc large amts of energy without the use of excessive currents. The continuous absorption and evolution of H_2 by the molten metal are equiv. to a thorough washing of the metal with hot H_2, which is regarded as responsible for the very high elastic limit of the deposited metal. Expts. in an atm. of water gas, of MeOH, of NH_3 and of H_2 and N_2 indicate the feasibility of using them on a large scale industrially. The app. employed and various samples of welds in H_2 are illus. W. H. BOYNTON

Welded joints searched by x-rays. J. T. NORTON. *Iron Age* **118,** 409–12(1926).—Defects in fusion welds, and methods of testing welds, are described X-rays for making radiographs or shadow-pictures have been used to show the internal condition of welds The results obtained are illustrated, showing various kinds of defects. Welding in an atm. of H, though preventing oxidation, may cause gas-pockets in the metal. Cracks are shown on radiographs only if nearly parallel to the x-ray beam. The method is limited to steel 3.5 in. thick, and shows defects more than 5% as thick as the sample.
G. F. C.

Use of lead pipe scrap for the manufacture of solder. KL. *Apparatebau* **38,** 202(1926). J. H MOORE

Some experiments on the soft soldering of copper. T. B. CROW. *J. Inst. Metals* March **1926,** 14 pp -Exptl data are given on the soldering of Cu, particularly in regard to the interfacial effects Some facts, microscopic evidence, and theories on the soldering are brought out Joints are examd over the range of 237–497° and microstructures are classified into 3 groups: (1) includes joints at 237–293°; (2) joints at 325 360°; and (3) joints at 402 497° Characteristics of each group are listed The formation and identification of the interfacial alloys are discussed and numerous photomicrographs shown. Conclusion· When molten Sn or Sn-Pb solder is applied to a hot clean Cu surface the material "H" having a compn approx. CuSn is formed The extent of the reaction depends upon time and temp A cryst boundary exists between Cu and "H" not unlike an ordinary grain boundary Adhesion between Cu and "H" takes place across this interface The CuSn alloy is dissolved, as formed, by the excess Sn, so longer "soaking" does not increase the thickness of the alloy At temps of 300° and over, a layer of blue mauve material is formed which is the η phase of the bronzes; its compn is approx Cu_3Sn. The increase of tensile strength produced by diminishing the thickness of the solder film is progressive until it becomes discontinuous as the result of union of 2 bands of gray alloy across the gap. An appendix covers the prepn. of microsections, the properties of CuSn, and Cu_3Sn, and the prepn of samples for scratch tests W. H BOYNTON

Relative effect of oxygen purity and temperature in metal cutting. F. P WILSON, JR. *Gen. Elec. Rev.* **29,** 722 7(1926), cf. *C. A.* **20,** 2143 C G. F.

A new process for coating (iron) with lead. HUGO KRAUSE *Apparatebau* **38,** 200-1(1926); cf. *C A.* **20,** 2648 J. H. MOORE

Treatment of waste acid waters from metallurgical plants. ARMAND CLAUSE. *Rev. chim ind* **35,** 237–40(1926) --A brief discussion of the advantages of recovering the acid and $FeSO_4$ A. PAPINEAU-COUTURE

Some properties of electrolytic iron (FULLER) **4.** Apparatus for ore flotation (U. S. pat. 1,598,858) **1.** Apparatus for utilization of heat from coke, slags, ashes, etc , for steam production (U. S. pat. 1,597,718) **21.**

DERUILLE, C.· **Fonderie moulage et fusion.** Paris Masson & Cie. Gauthier Villars & Cie 253 pp.

The Development of "Staybrite" Steel, Its Properties and Uses. Sheffield: T. Firth & Sons, Ltd 96 pp. 12s 6d

LATHROP, WM. G. **Brass Industry.** Mt Carmel, Conn. Wm. G. Lathrop. 174 pp. $2 00. Reviewed in *Metal Ind* **24,** 380(1926)

WATSON DAVIS, C. E.: **The Story of Copper.** New York· Century Co. 385 pp. $3. Reviewed in *Iron Age* **118,** 226(1926).

Concentrating ores by flotation. A. B. EMERY. U. S 1,599,561, Sept 14 Mech. features.

Enriching ores and coal. G. RANWEZ. Can 258,537, Mar. 2, 1926. Ores and coal, to be treated for enrichment, are classified in beds or sections of different densities in inclined strainers and are carried along by a current of liquid, the products are successively discharged from each bed or section by successive pulsations followed by a period of rest. whereby the particles of different densities which have been carried along in a given section are released from the evacuation

Ore treating process. L. W. AUSTIN and P W. LEE. Can. 258,442, Feb. 23, 1926. Ores, concentrates, sands and other materials carrying values are treated with an amalgam which consists of Na, Zn and Hg in the presence of an electrolyte soln ; the Na should not exceed 10% of the weight of Hg and the Zn should not exceed 15% of the said weight.

Treating sulfide ores of lead, silver and copper. N. C. CHRISTENSEN. Can. 257,524, Jan. 26, 1926. Sulfide ores are treated for the recovery of metals by mixing with a hot concd. chloride contg. acid, thereby decompg. the Pb, Ag and Cu contained in the ores, dissolving the metals of the minerals in the soln , and sepg. the soln. from the treated ore and pptg. Cu therefrom with metallic Pb.

Treating sulfide ores of lead, silver and copper. N. C. CHRISTENSEN. Can. 257,526, Jan. 26, 1926. Sulfide ores are treated for the recovery of metals by mixing with a hot concd. chloride brine contg. acid, thereby decompg. the Pb, Ag and Cu contained in the ores, dissolving the metals of the minerals in the soln., sepg. the soln. from the treated ore and pptg. Ag with metallic Cu; metallic Cu is then pptd. with metallic Pb, and Pb is pptd. by electrolysis.

Treating ores containing galena. N. C. CHRISTENSEN. Can. 257,523, Jan. 26, 1926. Ores contg. galena are treated by lixiviating with a hot concd. soln. of NaCl contg. acid, the Pb of the galena, being thereby dissolved, sepg. the soln. from the ore, cooling the soln., the Pb being pptd. as a chloride, sepg the $PbCl_2$ and smelting it with limestone to obtain metallic Pb and $CaCl_2$, which may be used to ppt. the sulfates in the treatment

Treating lead zinc sulfide ores. N. C. CHRISTENSEN Can. 257,525, Jan. 26, 1926. Pb Zn sulfide ores are heated with strong brine and H_2SO_4, thereby causing the Pb to pass into soln. while the ZnS remains unattacked, the hot soln. is then sepd. from the ZnS, the soln cooled to cause a partial crystn of Pb salt, and the liquid heated for re-use. Cf. *C. A* **20,** 1213

Iron sulfide ore. A. T. K. ESTELLE. Can. 262,090, June 29, 1926 FeS ores contg. other valuable metals from which FeS has been removed are treated by leaching in a closed vessel with heat by means of HNO_3 and HCl, treating the residue with strong NH_4 sulfate or acetate, pptg the Pb with H_2S and treating the soln from the leach with hot H_2SO_4.

Oxide raw material. T. R. HAGLUND. Can. 260,128, Apr. 27, 1926. Ores contg metal oxides which do not fuse below 1940° are purified by removing oxides of Fe, Si and Ti and dissolving the refractory oxide in a sulfide-contg. slag by fusing the ore with metallic sulfides and a reducing agent and sepg the reduced Fe, Si or Ti from the sulfide-refractory-oxide slag

Ore oxidizing process. G. W. EDWARDS and H. T. DURANT. Can. 260,074, Apr. 27, 1926 Ores contg. Zn in the oxidized condition are leached with an excess of an aq. soln of NH_4 carbonate contg. an excess of free NH_3, the charge is kept in agitation and the temp. is maintained as near as possible to, but always slightly below, the temp. at which the NH_4 salt commences to dissoc , or the dissolved metal commences to be pptd.

Heat-treatment of mercury ores. C. J. REED. U. S. 1,599,372, Sept. 7. Hg ore is caused to move (*e g*, through an inclined retort) progressively from a lower to a higher level into and out of a heated zone (which may be at the middle of the retort) against a stream of air.

Treating lead-zinc sulfur ores, mats, etc. E. A. ASHCROFT. U. S. 1,599,269, Sept. 7. See Can. 247,418 (*C. A.* **19,** 2303).

Refining nickel mat or nickel-copper mat. O. LELLEP. U. S. 1,599,424, Sept. 14. In eliminating S from mat or metal, the molten material is treated with a blast of air and additional heat is supplied to the reaction.

Antimony from its alloys. HÜTTENWERKE TEMPELHOF A. MEYER. Brit. 241,223, Oct. 11, 1924. To obtain Sb from its alloys, *e. g.*, an alloy contg. Sn 40, Cu 40, Pb 10 and Sb 10%, the alloy is melted and treated (preferably in finely divided state) with sufficient S to form sulfides of the other metals of the alloy and the metallic Sb is then sepd. from the sulfides.

Tungstic oxide and tungsten. K. ANJOW. Brit. 241,399, Nov. 13, 1924. WO_3 is obtained as a residue by treating W ores such as wolframite, scheelite or ferberite, ground to 0.02 mm. or smaller, with acids such as H_2SO_4, HNO_3, HCl or SO_2. The WO_3 may be reduced with charcoal at 1200°.

Manufacture of lead compounds from ores, etc. A. NATHANSOHN. Can. 257,951, Feb. 9, 1926. $PbCO_3$ is obtained from Pb-contg. ores, metallurgical products, and waste products of chem. processes, by lixiviating the raw materials with solns. of chlorides of non-heavy metals, adding substances which have a basic reaction against litmus and leading in CO_2.

Stack, flue and scrubbing apparatus for treating fumes from smelting sulfide ores and the like. M. M. MEDIGOVICH. U. S. 1,599,027, Sept. 7.

Smelting furnace. J. H. GRACE. U. S. 1,599,885, Sept. 14. Ore (*e. g.*, magnetite

Fe ore) is passed through a kiln before its delivery to a smelting furnace and is reduced in the kiln by hot gases from the furnace. Means, such as a H_2O jacket, are provided adjacent the connection between the furnace and kiln for tempering the heat of the gases.

Blast furnace. J. KENNEDY. U. S. 1,598,776-7, Sept. 7.

Regenerative hearth furnace for reheating, etc. BROWN BAYLEY'S STEEL WORKS, LTD., F. G. BELL and W. HARROD. Brit. 241,471, Apr. 29, 1925.

Furnace for heat-treatment of wire in coils, etc. A. F. JACQUEMIN. Brit. 241,451, March 20, 1925.

Continuous furnace for heating billets and packs of metal plates. J. J. JONES. Brit. 241,589, Oct. 18, 1924.

Tin-pack-heating furnace. G. F. SOCKMAN. U. S. 1,599,594, Sept. 14.

Casting iron in permanent metal molds. D. H. MELOCHE. U. S. 1,597,861, Aug. 31 In producing self-annealed gray Fe castings in metal molds, the molding surfaces are first coated with an adherent inert insulating refractory permanent lining such as fireclay and sol silicate and upon this there is placed a renewable coating of amorphous C which is sufficiently thick that it is substantially intact after the casting has been formed and removed from the mold. Cf. *C. A.* **19,** 1849.

Cast iron. H LANZ Can. 259,172, Mar. 23, 1926. The gray cast Fe contains at least 1 of the elements Ni, Cr, V, Mo, etc , and is predominantly of pearlite structure with moderate graphite veinings and of a moderate Brinell hardness. Cf. *C. A.* **19,** 1554.

Steel. J. C McGUIRE. U. S. 1,599,425, Sept 14. A steel which is suitable for dies and cutting tools comprises C 1 40, W 4, Cr 11.50, Ti 0.30, Ni 0.85, Si 0.35, Mn 0 23, P 0 025, S 0 025 and Fe 81.32%.

Supplying air blasts to steel converters. H. FOLKERTS. Brit. 241,258, July 10, 1924. To promote agitation of the Fe bath in a converter, the blast tuyères are made "frictionless" and the air is supplied to the bath at a pressure sufficient to cause its entry into the bath at a velocity equal to or greater than that of sound. An app. is described.

Metallic composition. E. F. KINGSBURY. Can. 259,845, Apr. 13, 1926. A contact alloy is composed of the following metals in the following proportions by weight: Au 72, Ag 26.2 and Ni 1.8%.

Metallic composition. J. R. TOWNSEND. Can. 259,842, Apr. 13, 1926. A resilient contact member composed of a metallic compn contains the following metals in the following proportions: tin 4 to $5^1/_2$, Pb 1 to 4, P 0 05 to 0.25% and the remainder Cu

Protected metal. F. M. CRAPO Can 258,383, Feb. 23, 1926 The surface of an Fe or steel article is nitrogenized and a Zn coating subsequently applied.

Steel protective method. J. D. KLINGER and C. L. BOYLE Can. 261,218, June 1, 1926. A method of cleaning steel and imparting thereto rust-inhibitive properties consists in treating it with a soln contg H_2SO_4, a sol. chromate, an alc. and acetone.

Separating constituents of alloys. C. G. BOSSIERE and H. ZANICOLI. Brit. 241,880, Oct. 23, 1924 Alloys such as bronzes are heated with a mixt. of S, an alkali sulfide, polysulfide or thiosulfate and the residue is treated with H_2O or a soln. of alkali sulfide. Pb and Cu sulfides remain insol and are roasted to obtain oxides and treated with H_2SO_4 to obtain sulfates. The thio-salt soln is treated with SO_2 to ppt Sn and Sb sulfides and these are heated to sublime free S and roasted to produce oxides and SO_2. The alkali salts left after pptn. of Sn and Sb sulfides are reduced to sulfides by heating with C.

Chrome alloy. G. B. NISBET. Can. 260,624, May 11, 1926. An alloying compn. consists of approx. 93% chromite, 5% NaCl, 5% NaOH, 5% C and 1% borax.

Molybdenum alloy. G. B. NISBET. Can. 260,625, May 11, 1926. An alloying compn. consists of a fused mixt. of approx. 93% MoO_3, approx. 5% NaCl, 5% NaOH, 5% C and 1% borax.

Aluminum alloy. P. BERTHELEMY and H. DE MONTBY. U. S. 1,599,869, Sept. 14. A plumbago crucible lined with MgO is used for fusing a mixt. formed from wood charcoal, CaF_2, MgO, As_2O_3, Cu, Mn, ferro-Si, W, Mg and Al to produce an alloy rich in Cu and Mg and which may contain Mn, Fe, Si, W and Al. This rich alloy is run into ingot molds and subsequently mixed with pure Al.

Ferrous alloy. B. D. SAKLATWALLA. U. S. 1,599,435, Sept. 14. An alloy consisting mainly of Fe and which is hard and ductile comprises Cu 0.15-0.50 and Cr 0.3-3.5% and may also contain small quantities of other elements.

Alloy steel. F. M. BECKET and A. L. FEILD. Can. 257,643, Jan. 26, 1926. The thermally hardened alloy steel contains Zr in assocn. with an alloying element or elements, the latter in normal proportion.

Alloys containing zirconium and silicon. ELECTRO METALLURGICAL CO. Brit. '41,844, July 7, 1925. The Si content of alloys contg. Zr and Si, such as those described n Brit. 197,573 (*C. A.* **17**, 3676), is reduced, preferably to below the Zr content, by treating the alloy with an aq. solvent for Si such as a soln. of an alkali hydroxide or carbonate r an alk. earth hydroxide. Dil. H_2SO_4 may be used for reducing the content of Fe n the alloy.

Nickel alloys. WESTERN ELECTRIC CO, LTD. Brit 241,756, Dec. 24, 1924. An alloy of Ni 80 and Fe 20% or other alloy rich in Ni is prepd. by melting together the onstituents, cooling the melt until it solidifies, immediately remelting, then immediately casting and working as by rolling or forging, without annealing.

Copper alloys. E. I. DU PONT DE NEMOURS & CO. Brit. 241,687, Sept. 24, 1924. Corrosion-resisting alloys are prepd. contg. Si 3-15 and Mn 0 5-3% and as free as posible from Fe.

Eutectic alloys by fractional solidification. HÜTTENWERKE TEMPELHOF A. MEYER. Brit. 241,224, Oct. 11, 1924. A eutectic alloy contg. Sn 55, Pb 41.4, Cu 0 1 and Sb 3 5% may be obtained in solid form by slowly cooling a molten alloy contg Sn 44, Pb 32, Cu 4 and Sb 20% or from an alloy contg. Sn 70, Pb 13, Cu 5 and Sb 12%, the solid esidue in the latter instance being a bearing metal contg. Sn 76, Sb 16, Cu 7 and Pb %. Tilting or stationary furnaces adapted for the process are described.

Lead alloy. W. and H. MATHESIUS. Can. 258,249, Feb. 23, 1926. A Pb alloy s made which contains Pb as its major constituent and smaller quantities of an alkaliorming metal and Cu.

Mold for casting metals. H S. LEE. U. S. 1,599,423, Sept. 14. Permanent molds which may be formed mainly of cast Fe have their inlet neck surfaced with a metal of higher m p.

Rotary drum and associated apparatus for casting sheets of aluminum, brass, copper or other metals. C. W. HAZELETT U. S 1,600,668, Sept. 21.

Cleaning tin plate. C. FINNEGAN. U. S. 1,598,125, Aug. 31. Mech. features of brushing and heating to remove oil from the plate after treatment with absorbent material such as middlings.

Magnetizable material. E. SCHURER. Can. 263,001, July 27, 1926. An alloy of Fe, Al and Si in which the proportion of Al is 1% and that of Si 0 7%.

Galvanizing sheets by the lead-zinc process. R PASSEKER. Brit. 241,226, Oct. 11, 1924. Various mech. features are described, for feeding sheets in the direction of their breadth through a layer of NH_4Cl into a Pb bath and then into a bath of molten Zn.

Electric welding. W. F. STOODY. U. S. 1,600,856, Sept. 21. In d. c. elec. welding, the work is made the negative electrode and a ferrous welding rod low in C and substantially free from lime is used as the positive electrode.

Electrodes for welding, etc. H. D. LLOYD and C. E. HILL. U. S. 1,599,056, Sept. 7. A coating compn. for electrodes comprises siliceous fireclay and titaniferous Fe ore, substantially free from carbonates and from C.

10—ORGANIC CHEMISTRY

CHAS. A. ROUILLER AND CLARENCE J. WEST

Unsaturated aldehydes from acetylene alcohols. H. RUPE AND E. KAMBLI. *Helvetica Chim. Acta* **9**, 672(1926).—Acetylene alcs. (ethinylcarbinols) are rearranged by warming with acids (HCO_2H gives the best result) to give 80% of unsatd. aldehydes. *3-Methyl-1-ethinyl-cyclohexanol* (optically active) yielded the aldehyde $CH_2.CH_2.CH_2.CH(CH_3).CH_2.C{:}CHCHO$, b_{10} 85°, $[\alpha]_D$ 133°, d_4^{20} 0.9433; *semicarbazone*, m. 205°; *oxime*, m. 81°. T. S. CARSWELL

From the life history of some organic radicals. P. WALDEN. *Z. angew. Chem.* **39**, 601–6(1926).—Historical review of the first use and the development of many of the common org. radicals. R. C. ROBERTS

Changes in configuration in substitution reactions. WALTER HUCKEL. *Z. angew. Chem.* **39**, 842–51(1926).—A general review with 61 references. C. J. WEST

1-Olefins. A. KIRRMANN. *Bull. soc. chim.* **39**, 988–91(1926).—Grignard compds. of suitable alkyls were added gradually to 1 mol C_3H_5Br in Et_2O, and the mixt. was boiled 1 hr. and fractionated. The yields were excellent, the products pure, and the end position of the double bond was carefully demonstrated. For C_6H_{10}, Pr_2O was used as solvent. The consts. found were: $1\text{-}C_5H_{10}$, b. 30.5–1°, d_{21} 0.641, n_{21} 1.3714; dibromide

b. 184°, d_{18} 1.668, n_{21} 1.5088; 1-C_6H_{12}, b. 62°, d_{18} 0.684; dibromide, b_{11} 82–3°, d_{19} 1.592, n_{19} 1.5012; 1-C_7H_{14}, b. 92–3°, d_{19} 0.700, n_{19} 1.4000; dibromide, b_{12} 98–9°, d_{19} 1.509, n_{19} 1.5020; 1-C_8H_{16}, b. 121–2°, d_{19} 0.716, n_{19} 1.4085; dibromide, b_{14} 116–8°, d_{19} 1.453, n_{19} 1.4961. BEN H. NICOLET

Preparation of true acetylenic alcohols from the mixed dimagnesium derivatives of acetylene. R. LESPIEAU. *Bull. soc. chim.* **39**, 991–4(1926); cf. *C. A.* **19**, 813; **20**, 978.—L. continues the study of the reactions of aldehydes and ketones on mixed dimagnesium acetylides. By means of a modified procedure, 7 new syntheses are effected, including 2 new derivs. contg. the ethinyl group. These are: *methylethinylcarbinol*, CH:CCH(OH)Me, prepd. from AcH, b. 106.5–7.5°, d_{20} 0.8858, n_D 1.4265, mol. wt. by cryoscopy 71; *monochloromethylethinylcarbinol*, CH:CCH(OH)CH_2Cl, prepd. from chlorinated aldehyde, b_{19} 60°, d_{20} 1.171, n_D 1.475, mol. wt. 106, is easily transformed into the glycol CH:CCH(OH)CH_2OH and its derivs.; *1,2-dichloroethylethinylcarbinol*, CH:CCH(OH)CHClCH_2Cl, from dichloroacrolein, b_{12} 91°, $d_{23.5}$ 1.306, n_D 1.500, mol. wt. 152, transformable into the trihydroxyglycerol and its derivs.; *vinylethinylcarbinol*, CH:CCH(OH)CH:CH_2, from acrolein, b. 128.5–9.5°, d_{23} 0.9175, n_D 1.4525, mol. wt. 85, gives a hexa-Br compd., m. 77–9°; *bromovinylethinylcarbinol*, CH:CCH(OH)CBr:CH_2, from brominated acrolein, b_{17} 78–9°, d_{18} 1.501, n_D 1.5135, mol. wt. 164, is resinated by alk. solns.; dimethylethinylcarbinol, CH:CC(OH)Me_2, prepd. previously by Hess and Munderloh by the action of Na acetylide on acetone and by Scheibler and Fischer by the action of C_2H_2 on acetone that has been treated with sodamide, $d_{16.5}$ 0.8637, n_D 1.4212, mol. wt. 83, m. −3.0 to −3.5°; *phenylethinylcarbinol*, CH:CCH(OH)Ph, from BzH, b_{18} 114–5°, $d_{18.5}$ 1.053, n_D 1.548, mol. wt. 127. All the cryoscopic detns. were made in AcOH. These alcs. ppt. NH_3-$AgNO_3$, the reactive Hg of Johnson and (except in the case of the one obtained from acetone) NH_3-CuCl and alc. $AgNO_3$. C. D. INGERSOLL

Myricyl alcohol. S. GOTTFRIED AND F. ULZER. *Chem. Umschau Fette, Oele, Wachse u. Harze* **33**, 141–5(1926).—Myricyl alc. was prepd. from carnauba wax, the impurities from which had been removed by extn. with alc. at 25–35°. The wax was sapond. with 20% alc. KOH soln. for 48 hrs. under reflux and the alc. evapd., yielding a mixt. of K soaps and alcs. The latter were extd. with C_2HCl_3, acetylated, fractionally distd. twice at 10 mm., then crystd. and again sapond. to liberate the alcs. Three fractions were obtained: (1) heptacosane $C_{27}H_{56}$, m. 59.0–59.5°, (2) ceryl alc., m. 79°, (3) myricyl alc., m. 88°. P. ESCHER

Remarks on Kluyver, Donker and Visser't Hooft's paper "The formation of acetylmethylcarbinol and 2,3-butyleneglycol." A. LEBEDEV. *Biochem. Z.* **166**, 407–8 (1925).—Cf. *C. A.* **19**, 3510. Priority claim. S. MORGULIS

The pyrogenation of formic acid. J. A. MULLER AND (MLLE.) E. PEYTRAL. *Bull. soc. chim.* **39**, 995–1000(1926).—The previous interpretation of this reaction is cor. (*C. A.* **15**, 1441). The decompn. is treated mathematically and is shown to consist of 2 consecutive reactions: (I), the decompn. of HCO_2H into CO_2 and H_2, and (II), the reaction of these products to form CO and H_2O. M. shows that I is complete at the end of about 0.01 sec. and that the equil. condition of the system (where CO_2, H_2, CO and H_2O are present in sensibly equal mol. proportions) is then attained. The mol. fraction of CO_2 formed in a given time interval minus the mol. fraction decompd. is found to be continuously equal to 0.49 ± 0.01 after an initial time interval of about 0.002 sec. All calcns. are based on a time interval of 0.01 sec. and unless this is done it would be impossible to know that the final equil. is obtained through these 2 successive reactions; this consideration applies to all pyrogenetic reactions where the coeff. of velocity of decompn. is high. C. D. INGERSOLL

New method of diagnosing potential optical activity. II. The optical activity of chlorobromoacetic acid. JOHN READ AND ANN M. MCMATH. *J. Chem. Soc.* **1926**, 2183–91; cf. *C. A.* **19**, 2927.—ClBrCHCO_2H was prepd. by heating ClBrC$(CO_2H)_2$ at 130°; heating 1 hr. with excess 0.1 *N* NaOH causes 66% hydrolysis. The brucine salt, $[\alpha]_D$ −17.0° (0.2528 g. in 20 cc. $CHCl_3$), could not be resolved by fractional crystn. The *l-hydroxyhydrindamine salt* (I), m. 165°, $[\alpha]_D$ −20.0° (0.2518 g. in 20 cc. MeOH), −56° (Me_2CO), could not be resolved by crystn. from AcOEt. The corresponding *dichloroacetate*, m. 139°, $[\alpha]_D$ −24.6° (MeOH). Both salts have a slow downward mutarotation. If I is rapidly crystd. from $CHCl_3$ there first seps. the *d-chlorobromoacetate* (II), m. 157° (decompn.), $[M]_D$ −178°, decreasing to −129° in 36 hrs. (Me_2CO); in MeOH a const. value of −64° was observed. II undergoes a rapid partial racemization when dissolved in Me_2CO or MeOH. A soln. of 0.1032 g. of I in $CHCl_3$ contg. 5% of its vol. of MeOH has $[\alpha]_D$ −15.5°, $[M]_D$ −50°, which is not changed on keeping or heating the soln. A similar detn. with II revealed the absence of any measurable

optical rotation under these conditions; after heating for 20 min. on the H_2O bath, $[M]_D$ is —38° and after standing a further 12 hrs., —50°. **II** (0.2024 g.) in 20 cc. AcOH showed $[\alpha]_D$ —19.7°, $[M]_D$ —62°; **I** in AcOH showed an initial value for $[M]_D$ of —32°, increased to —50° after heating 20 min. on the H_2O bath and to —58° after heating a further 2 min. over a free flame. Similar results were obtained with *d*-hydroxyhydrindamine. The equil. was not changed when the soln. was exposed to a beam of plane or circularly polarized monochromatic light in a magnetic field. C. J. WEST

Synthesis of certain higher aliphatic compounds. II. The hydration of stearolic acid. GERTRUDE M. ROBINSON AND ROBERT ROBINSON. *J. Chem. Soc.* **1926**, 2204–9; cf. *C. A.* **19**, 1128.—*4-Ketomyristic acid*, m. 87°, results in 26% yield from the Na deriv. of Et 2-acetylundecoate and $MeOCOCH_2CH_2COCl$; *oxime*, m. 74°. $EtOCO(CH_2)_7$-COCl (b_{20} 182°) and the Na deriv. of Et 2-acetyldecoate give 36% of 9-ketostearic acid (**I**), m. 83°; the oily oxime gives an amide, m. 79°. *10-Ketononadecoic acid* (**II**), m. 86–7°; *amide*, m. 83°. Values of the m. p. of mixts. of **I** and **II** are given up to 64% **I**. By means of these values it is shown that the hydration product of stearolic acid consists of 42.4% of **I**, the remainder being **II**. These values were not appreciably modified by crystn. of the mixt. from light petroleum or by purification through the Na salt. G. Shearer examd. **II** by x-ray methods, knowing only the general form of the acid and deduced not only the correct compn. but also the constitution of **II**. *10-Ketobehenic acid*, m. 94° (32.6% yield); *amide*, m. 99°. C. J. WEST

Optical resolution of chlorosulfoacetic acid. JOHN READ AND ANN M. MCMATH. *J. Chem. Soc.* **1926**, 2192–8; cf. Backer and Burgers, *C. A.* **19**, 1128.—*dl*-$ClCH(SO_3H)$-CO_2H and *l*-hydroxyhydrindamine in MeOH give 40% of *l-hydroxyhydrindamine d-chlorosulfoacetate* (**I**), m. 203° (decompn.), $[\alpha]_D$ —18.0°, $[M]_D$ —85° (0.2002 g. in 20 cc. MeOH); no mutarotation was observed after 2 days. Evapn. of a MeOH soln. of **I** and resoln. in cold MeOH caused a decrease of $[\alpha]_D$ to —12.5°. The same concn. in H_2O gave similar values and the aq. soln. showed a similar decrease in the value of $[\alpha]_D$. In AcOH, 0.1350 g. gave $[\alpha]_D$ —19.2°. **I** and brucine yield the brucine salt, m. 196° (slight decompn.), $[\alpha]_D$ —2° (0.2036 g. in 20 cc. MeOH). Decompn. with *N* NH_4OH yields the *NH_4 salt*, crystg. with $1H_2O$, decomps. 207°, $[\alpha]_D$ 13.8°, $[\alpha]_{5461}$ 16.3° (0.7376 g. in 20 cc. H_2O); upon evapn. to dryness of an aq. soln., the value of $[\alpha]_D$ rose to 26.6°; the optical activity gradually declined to the original value in about 12 hrs. and complete racemization occurred upon then evapg. the soln. to dryness. Complete racemization attends the slow evapn. of dil. solns. It is possible that the salt exists in 2 dynamically isomeric forms possessing different rotatory powers. **I** and benzidine acetate yield the *benzidine salt*, decomps. 245°, $[\alpha]_{5461}$ 15.7° (0.0858 g. in 30 cc. H_2O), the optical activity is lost on evapn. to dryness. *l-Hydroxyhydrindamine l-chlorosulfonate* could not be completely purified; the sample examd. showed $[\alpha]_D$ —24.0° (0.2004 g. in 20 cc. MeOH) and —17.0° (0.2001 g. in H_2O). The brucine salt decomps. 235°. The *NH_4 salt* has $[\alpha]_D$ — 10.6°. C. J. WEST

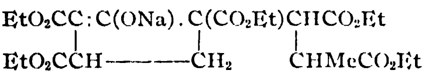
Rotatory dispersion of the esters of lactic acid. II. The isomeric butyl esters. C. E. WOOD, J. E. SUCH AND FRANK SCARF. *J. Chem. Soc.*, **1926**, 1928–38; cf. *C. A.* **17**, 1952.—In the isomeric Bu lactates, the iso-Bu ester shows an increase while the tert. and inactive sec. Bu esters show a considerable decrease in rotation. Enhanced rotation results when there are 2 asym. centers of the same sign in the mol. (*d-sec*-Bu *l*-lactate). Pronounced decrease in rotation occurs when there are 2 asym. centers of opposite sign in the mol. (*d-sec*-Bu *d*-lactate). All the esters examd. are normal and complex with the exception of *d-sec*-Bu *d*-lactate, which shows anomalous rotatory dispersion. The effect of temp. on the rotation is in all cases small. Max. occur in the rotation-temp. curves for the iso-Bu ester and intersections take place in those for the anomalous ester. Iso-Bu *l*-lactate, b_{13} 73.1°, d_4^{18} 0.9755, $[\alpha]_D^{18}$ 13.03°; d. and $[\alpha]$ are given for temps. from 14.1° to 138° and for λ = 6708 to 4359. *tert*-Bu *l*-lactate, b_9 46–7°, d_4^{20} 0.9139, $[\alpha]_D^{20}$ 9.48°; values are given from 3° to 111.1° for d and $[\alpha]$. *d-sec-Bu l-lactate*, from the alc. and Et *l*-lactate, b_7 59°, d_4^{20} 1.0041, $[\alpha]_D^{20}$ 20.67°; values for d and $[\alpha]$ from 2.1° to 137.8°. *d-sec-Bu d-lactate*, b_{16} 69–70°, d_4^{20} 1.0047, $[\alpha]_D^{20}$ —1.83° values of d. and $[\alpha]$ from 2.5° to 100°. *dl-sec-Bu l-lactate*, b_{12} 65–7°, d_4^{20} 0.9968, $[\alpha]_D^{20}$ 9.45°; values of d and $[\alpha]$ from — 10.8° to 125.8°. C. J. WEST

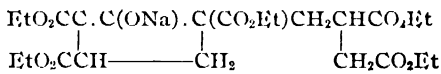
Structure of lactones from simple sugars. Trimethyl-γ-arabonolactone and the supposed β-gluconolactone and β-mannonolactone. W. N. HAWORTH AND V. S. NICHOLSON. *J. Chem. Soc.* **1926**, 1899–902.—Methylation of γ-arabonolactone with MeI and Ag_2O and purification through the Na salt gives trimethyl-γ-arabonolactone, identical with that obtained by Baker and Haworth (*C. A.* **19**, 1409) by oxidizing tri-

methyl-γ-arabinose with HNO_3. This confirms their structure for trimethyl-γ-arabinose. The compds. considered β-lactones by Nef (*C. A* 8, 1738) are regarded as δ-lactones, contg. a 6-membered ring (1,5-oxide) corresponding to the normal or amylene-oxidic form of the parent sugars. C. J. West

Reversible oxidation-reduction systems of cysteine-cystine and reduced and oxidized glutathione. E. C. Kendall and F. F. Nord. *J. Biol. Chem.* **69**, 295–337 (1926).—The potential drifts observed in solns. of cysteine and cystine by Dixon and Quastel (*C. A.* **18,** 380) were confirmed. These drifts are attributed to changes in the *sulfydryl* group rather than in the electrode. The drift was eliminated by allowing the solns. to stand several hrs. for equil. Cystine does not affect the Pt electrode nor does it oxidize reduced indigo. In the presence of indigo carmine or other H acceptor, H_2O_2 and NaS_2 form addn products with cystine. The ratio cysteine: cystine dets. the abs value of the oxidation-reduction potential of these solns. at the equil point. Indigo is oxidized and indigo carmine reduced in such solns Cysteine cannot reduce indigo carmine and cystine cannot oxidize reduced indigo in the absence of the O addn. product. A soln. of reduced glutathione may be deoxygenated so that it cannot reduce indigo carmine. Addn. of mol O, H_2O_2 or Na_2S_2 permits this reduction. Solns. thus prepd. form a reversible oxidation-reduction system. These forms of glutathione are relatively stable substances in which the S atom is unable to influence physiol. oxidation and reduction. Under certain conditions glutathione can exist as a highly reactive O addn. product in which the S atom can change its state of oxidation. This form and the more stable SH and SS forms of glutathione make a reversible oxidation-reduction system. The O addn. product is the essential part of this system A. G.

Constitution of the yellow sodium compounds formed from ethyl citraconate (or itaconate) and ethyl sodiomalonate. C. K. Ingold and C. W. Shoppee. *J. Chem. Soc.* **1926,** 1912–7; cf. I. S. and Thorpe, *C. A.* **20,** 2823.—The mixed Na deriv. obtained from 105 g. Et citraconate, 91 g $CH_2(CO_2Et)_2$ and 26 g. Na in 300 g EtOH, shaken with HCl and Et_2O, gives *Et ω-1,3,4-tricarbethoxy-2-ketocyclopentylmethylsuccinate*, m. 83°, gives a cherry-red color with $FeCl_3$; this also results from Et citraconate and $(EtO_2C)_2$-$CHCH_2CH(CO_2Et)CH_2CO_2Et$ and EtONa. Hydrolysis with 30% HCl gives 85% of *ω-4-carboxy-2-ketocyclopentylmethylsuccinic acid* (I), m. 173°. The oily by-product is *Et α-1,3,4-tricarbethoxy-2-ketocyclopentyl-β-methylsuccinate,* also obtained from Et citraconate and $MeCH(CO_2Et)CH(CO_2Et)CH(CO_2Et)_2$ with EtONa; hydrolysis gives *α-4-carboxy-2-ketocyclopentyl-β-methylsuccinic acid,* m. 148–9°. The *Et ester* of **I,** b_{11} 247°, gives a semicarbazone, m. 105°. Oxidation of I in $NaHCO_3$ with 3% $KMnO_4$ gives β,δ-dicarboxysuberic acid, m. 206–7°. *Butane-α,α,β,γ-tetracarboxyamide,* m. 267° (decompn.). The original insol. yellow Na deriv. is a mixt. of **II** and **III** contg an excess of **III.**


(II)


(III)

C. J. West

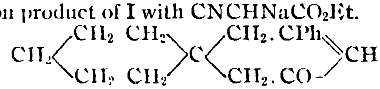
Oxidation of tartaric acid by solutions of silver salts. D. R. Maxted. *J. Chem. Soc.* **1926,** 2178–82.—Oxidation of 40 cc. 0.1 *N* tartaric acid with 125 cc. 0.1 *N* $AgNO_3$ and 23 1 cc. *N* NH_4OH gives 0.8859 mol. $(CO_2H)_2$, 1.099 mols. HCO_2H and 1.118 mols. CO_2. The amt. of $(CO_2H)_2$ formed is chiefly dependent upon the concn of the alkali; with 8, 12, 13 and 15 cc. *N* NH_4OH, the $(CO_2H)_2$ formed was 0 4150, 0.5139, 0.5885 and 0.7260 mol. With 16 cc. NH_4OH the reaction was incomplete after 1 week. Addn. of NaOH increases the yield; the reaction takes place readily in the presence of quantities of NH_4OH which would inhibit it in the absence of the NaOH; the substitution of 1 cc. of NaOH for 1 cc. NH_4OH increases the yield of $(CO_2H)_2$ 23%. $(CH_2O)_2$ gives no $(CO_2H)_2$ but equimol. amts. of CO_2 and HCO_2H. $CHOCO_2H$ gives per mol.: 1.997 atoms Ag, 0.1712 mol. $(CO_2H)_2$, 0.8165 mol. HCO_2H. Since, with an excess (6–8 mols.) of $AgNO_3$, the soln. slowly deposits 6 atoms of Ag per mol. tartaric acid, the reaction probably proceeds according to the equations $C_4H_6O_6 + 3Ag_2O \longrightarrow$ (1) $2(CO_2H)_2 + 6Ag + H_2O$; (2) $(CO_2H)_2 + HCO_2H + CO_2 + 6Ag + H_2O$; (3) $2HCO_2H + 2CO_2 + 6Ag + H_2O$. If $[HO_2CCH(OH)]_2$ were an intermediate product, its further oxidation should require 2 mols. $AgNO_3$; it actually deposits quantities of Ag varying from 2.3 to 5.4 atoms per mol. of the acid used. C. J. West

Dynamic isomerism. XXII. Methanol as an amphoteric solvent for the mutarotation of the sugars. I. J. Faulkner and T. M. Lowry. *J. Chem. Soc.* **1926,** 1938–43; cf. *C. A.* **20,** 1163.—Purified MeOH, which gave a velocity coeff. of 0.00018

when used as a solvent for the mutarotation of tetramethylglucose, gave a max. velocity coeff of 0.0018 when mixed with 3 times its wt. of cresol and of 0.035 when mixed with $^2/_3$ of its wt. of C_5H_5N. Since MeOH is sufficiently acidic to form a complete catalyst with C_5H_5N and sufficiently basic to form a complete catalyst with cresol, it must also be able to act alone as an amphoteric solvent to promote the mutarotation of the sugars. The velocity of mutarotation of tetramethylglucose in purified EtOH has been reduced to 0.00016 or about 80 times less than the velocity in H_2O. Since the chem. properties of EtOH are similar to those of MeOH, it is probable that a part of this velocity is again due to the solvent itself. C. J. West

Aldehyde decomposition of sugars. G. Klein. *Biochem. Z.* **169,** 132-8(1926).—A great no. of sugars, when boiled in the presence of *dimedon,* yield H_2CO, which ppts. with the dimedon as *formaldimedon.* Some of the methylpentoses yield AcH instead of H_2CO. Tables of the sugars which undergo these reactions are given. W. D. L.

Crystalline tetramethylmannose. W. L. Lewis and R. D. Greene. *Science* **64,** 206(1926)—Extn. of the hydrolysis product of Me tetramethylmannoside with low-boiling petroleum ether gives a cryst. tetramethylmannose, monoclinic system (?) and of the α-form, since the sp. rotation in H_2O drops from 7.4° to 2.4°. Oxidation with Br gives a lactone, whose sp. rotation in H_2O drops from 136.4° to 62.8° C. J. West

Chemistry of the three-carbon system. VI. Some systems containing the benzoyl group. M. D. Farrow and G. A. R. Kon. *J. Chem. Soc.* **1926,** 2128-38; cf. *C. A.* **20,** 3287.—Cyclohexanone (200 g.) and 275 g. BzMe in 1000 cc. 5% EtONa give 40% of *α-Δ^1-cyclohexenylacetophenone* (I), b_{17} 176-8°, d_4^{18} 1.04411, n_D^{18} 1.55886, $[R_L]_D$ 61.87. The pale yellow oil gives an orange color with $FeCl_3$ and is not very volatile with steam. The *semicarbazone,* m. 120-1°, the *oxime,* 101-2°. Oxidation with O_3 gave only BzOH. I was synthesized by adding 0.5 mol. α-Δ^1-cyclohexenylacetyl chloride to PhMgBr (to which is added 1 mol. $ZnCl_2$ and dry PhMe, the Et_2O being removed *in vacuo*), the yield is 67%; the yield from cyclohexylideneacetyl chloride is 64%; using PhMgBr alone, the yield is never above 30%. Methylation of I gives a *ketone,* b_{15} 168-70°, $d_4^{18.5}$ 0.99896, $n_D^{15.5}$ 1.54314, $[R_L]_D$ 66.36, whose *semicarbazone,* $C_{16}H_{21}ON_3$, m. 191-2°. The *ethylated ketone,* b_{19} 184-5°, d_4^{21} 1.01155, n_D^{21} 1.54077, $[R_L]_D$ 70.85; *semicarbazone,* m. 212°. *α-Cyclohexylidenebutyronitrile,* d_4^{21} 0.92283, n_D^{21} 1.48917, $[R_L]_D$ 46.67, does not react with PhMgBr. No definite products could be isolated from the reaction product of I with $CNCHNaCO_2Et$. I and $AcCHNaCO_2Et$ in EtONa give the *ketone,* , b_{20} 210-20°, m. 69-70°; the best yield (18%) is obtained by heating on the H_2O bath for 1 week; about 25% are obtained in the cold. *Semicarbazone,* m. 219°; in the sunlight this assumes a bright yellow color, lost on recrystn. I and EtONa give 35% of a *compd.,* $C_{28}H_{32}O_2$, m. 201°, which, with AcOH gives the *compd.* $C_{28}H_{30}O$, m. 106°. I does not condense with BzH or piperonal. I is completely hydrolyzed by boiling with an equal wt. of KOH in H_2O for 96 hrs. Cyclopentanone does not condense with BzMe; synthesis gives *α-Δ^1-cyclopentenylacetophenone,* b_{16} 163-5°, d_4^{21} 1.04982, n_D^{21} 1.56437, $[R_L]_D$ 57.69; it gives a deep orange color with $FeCl_3$; the yield is 65%, starting with either acid (m. 51-2° and 63-4°); *semicarbazone,* m. 157°. The *ethylated ketone,* b_{11} 162°, $d_4^{18.5}$ 1.01725, $n_D^{18.5}$ 1.54191, $[R_L]_D$ 66.25; *semicarbazone,* m. 196.5°. $AcCHNaCO_2Et$ gives about 60% of a condensation product, whose *semicarbazone* m. 193° and turns yellow on exposure to light. EtONa gives an uncrystallizable gum. *α-Phenyl-γ-ethyl-Δ^{β}-penten-α-one,* b_8 138°, d_4^{18} 0.98638, n_D^{18} 1.54353, $[R_L]_D$ 60.10, *semicarbazone,* m. 90° (remains oily for several weeks); *oximino-oxime,* m. 158°; 1 mol. NH_2OH gives the *compd.* $C_{13}H_{19}O_2N$, m. 101-2°. *α-Phenyl-γ-ethyl-Δ^{γ}-penten-α-one,* b_{17} 146°, $d_4^{19.5}$ 0.98513, $n_D^{19.5}$ 1.53372, $[R_L]_D$ 59.34 (83% yield); *semicarbazone,* m. 171°. Both ketones with $AcCHNaCO_2Et$ give the same *semicarbazone,* m. 178-9°. C. J. West

Catalytic hydrogenation of conjugated double bonds. G. Vavon and Jakes. *Compt. rend.* **183,** 299-301(1926).—This reaction differs from hydrogenation by nascent H_2 in that 1,4-addn. does not occur, and that the conjugated system is less readily hydrogenated than isolated double bonds. The substances studied were compared by mixing 1 mol. of each of 2 compds. and treating them with 1 mol. of H_2, the substance fixing the most H_2 being the more easily hydrogenated. Styrene absorbed H_2 more easily than PhCH:CHCO$_2$H or PhCH:CHCOMe; cyclohexene more easily than

$CH_2.CH_2.CH_2.CH_2.CH:CCO_2H$. Allylacetic, propenylacetic and dimethylacrylic acids were compared separately with α-pinene. Here also the α-pinene was the more easily hydrogenated H. C. COLLINS

2,3,4-Trinitrotoluene. F. H. GORNALL AND ROBERT ROBINSON. *J. Chem. Soc.* **1926,** 1981–4.—If the crude "trinitrotoluene residues" are melted, β-trinitrotoluene (I) seps. 1st; only after 6–7 days is the product contaminated with the α- or γ-isomers; recrystn. from H_2SO_4 gives I in a satisfactory state of purity (12–13%). If the melt is stirred at 18° for 7.5 hrs., there results 11.6% I; this is impracticable in large-scale work and the regular yield is 6–7%. A complete examn. of the residues showed that 100 g. yielded 47.7 g. 2,4-$(O_2N)_2C_6H_3Me$, 12.3% I, 16.9 g. γ-isomer; the remaining 23 g. contains a mixt. of these same compds. I and Na_2SO_3 in H_2O give 90% of $(O_2N)_2$-$MeC_6H_2SO_3Na.2.5H_2O$, light amber; the NaOH soln., on being heated, develops an intense $KMnO_4$ color and deposits crystals with a bright beetle-green iridescence. Reduction of the salt with Fe and HCl gives 65–70% of *Na m-tolylenediamine-3-sulfonate,* decomps. 261°. In the prepn. of azo dyes, this salt gives redder shades than those produced by the isomeric 2,4,5-salt. The *Ac* and *Bz derivs.* were prepd. Oxidation with $KMnO_4$ gives *Na 2,4-dinitro-3-sulfobenzoate,* crystg. with 1.5 H_2O and deflagrates on being strongly heated. Reduction of 2,4,3-$(O_2N)_2H_2NC_6H_2Me$ with Fe and HCl gives *2,3,4-triaminotoluene,* m. 106°, which gives a violet color with $FeCl_3$; it is very readily oxidizable. *2,4-Dinitro-3-methoxytoluene,* m. 86°. *2,4-Dinitro-3-benzylaminotoluene,* yellow, m. 115.6°, from I and $PhCH_2NH_2$; the compd. from $(PhCH_2)_2NH$, yellow, m. 87–8°. *2,4-Dinitro-m-tolylpiperidine,* yellow, m. 101°; the corresponding *α-naphthylamine deriv.,* m. 169–70° (decompn.), and gives an intense blue color in H_2SO_4.
C. J. WEST

Preparation of phenyl isocyanate from benzazide. H. WIELAND. *Z. angew. Chem.* **39,** 900(1926). As a result of an accident occurring in the Freiburg Lab. attention is called to a procedure given in the last edition of "Gattermann's Praxis," page 136. In the prepn. of PhNCO (I) from BzN_3 (II), II in C_6H_6 is heated until N_2 ceases to evolve (see *C. A.* **3,** 2555). Before the I is distd. *in vacuo,* the C_6H_6 should be distd. off at atm. pressure to ensure complete decompn. of II. Goggles should be worn, and a water bath should be used for heating, as sudden heating in the presence of small quantities of undecompd. II may result in a serious explosion. F. C. HAHN

Dependence of rotatory power on chemical constitution. XXIX. Resolution of sulfoxides into their optically active forms. P. W. B. HARRISON, JOSEPH KENYON AND HENRY PHILLIPS. *J. Chem. Soc.* **1926,** 2079–90, cf. *C. A.* **20,** 1983.—*dl-4'-Amino-4-methyldiphenyl sulfoxide,* m. 169–70°, in 27% yield by heating p-$MeC_6H_4SO_2H$ with 4 parts $PhNH_2$ at 110–5° for 30 hrs. This was resolved by means of camphorsulfonic acid into the *d*- and *l*-forms (I), m. 151°, $[\alpha]^{25}_{5461}$ 123° and —122° (EtOH); rotations in various solvents are given for various wave lengths. The *l deriv. l camphorsulfonate,* m. 133–4°, $[\alpha]^{25}_{5461}$ 18.1° (EtOH), the *d-deriv. d-camphorsulfonate,* m. 133–4°, $[\alpha]^{25}_{5461}$ 17.2° (EtOH). The *dl*-Ac deriv., m. 183–4°, the *d*- and *l*-Ac derivs. (II), m. 173–4°, $[\alpha]^{25}$ 42.0°, 52.1°, 66.4° and —43.0°, —53.8° and —66.2° for λ = 6708, 5893 and 5461. *4'-Acetylamino-4-methyldiphenyl sulfone,* m. 194°; it is optically inactive when prepd. by oxidizing an active form. *dl-m-Carboxyphenyl Me sulfoxide,* m. 170–2°, prepd. by oxidizing the K salt of the corresponding acid with H_2O_2. The *d-sulfoxide* (III) was obtained by the use of brucine and *l*-menthylamine, it m. 134°, $[\alpha]^{25}_{5461}$ 137.6° (MeOH); values for other solvents and wave lengths are given. *Brucine salt,* m. 136–7°, $[\alpha]^{25}_{5461}$ 40.3° ($CHCl_3$); *l-menthylamine salt,* m. 171°, $[\alpha]^{25}_{5461}$ 68.9°. From the mother liquors, the *l*-sulfoxide, m. 133°, $[\alpha]^{25}_{5461}$ —133.5° (MeOH), was obtained. I, II and III exhibit complex rotatory dispersion. The sign of I is reversed in HCl soln. C. J. WEST

Contributions to the reaction of organomagnesium compounds on nitriles. The trimer of crotononitrile. P. BRUYLANTS AND L. MATHUS. *Bull. soc. chim. Belg.* **35,** 239–52(1926). **Benzoyl cyanide.** A. DE COSTER. *Ibid* 235–8. See *C. A.* **20,** 1798. **Ketonic cyanohydrins.** J. GEURDEN. *Ibid* 253–60.—See *C. A.* **20,** 1787. **α-Aminonitriles.** M. VELGHE. *Ibid* 229–34.—See *C. A.* **20,** 1053. W. B. PLUMMER

Action of dibenzoyl peroxide on benzene at low temperature in the presence of anhydrous metal chloride. J. BÖESEKEN AND A. F. A. REYNHARDT. *Proc. Acad. Sci. Amsterdam* **29,** 598–602(1926). (In English.)—See *C. A.* **20,** 1986. E. H.

Preparation of 3,5-dihalogenophenols. H. H. HODGSON AND J. S. WIGNALL. *J. Chem. Soc.* **1926,** 2077–9.—*3-Iodo-5-nitroanisole,* m. 84°. *3-Chloro-5-nitrophenyl benzoate,* m. 78°; *acetate,* m. 84°. *3-Bromo-5-nitrophenyl acetate,* m. 99°. *3-Iodo-5-*

nitrophenol, pale yellow, m. 136°; *benzoate*, m. 100.5°; *acetate*, m. 110° *1,4,6-Tribromo-3-iodo-5-nitrophenol*, m. 176°. *3-Chloro-5-aminoanisole*, m. 33°; *3-Br deriv.*, m. 52°; *3-I deriv.*, m. 86.5°. *3-Chloro-5-iodoanisole*, b 267–8°, solidifies at 0°; *3-Br deriv.*, m. 33°; *3-I deriv*, m. 51°. It is more convenient to hydrolyze the aminoanisoles and apply the Sandmeyer reaction than to hydrolyze the above halogenoanisoles. *3,5-Dichlorophenyl benzoate*, m. 55°; *acetate*, m. 38°. *3,5-Dibromophenyl benzoate*, m. 77°; *acetate*, m 53°. *3,5-Diiodophenyl benzoate*, m. 93°. *2,4,6-Tribromo-3,5-diiodophenol*, m. 226 8°. *3-Chloro-5-bromophenol*, m. 70°; *benzoate*, m. 62°; *acetate*, m. 45°. *3-Chloro-2,4,5,6-tetrabromophenol*, m. 205°. *3-Chloro-5-iodophenol*, m 60°; *benzoate*, m 54°; *acetate*, m. 47°, *3-chloro-2,4,6-tribromo-5-iodophenol*, m. 195°. *3-Bromo-5-iodophenol*, m. 82.5°; *benzoate*, m. 76°; *acetate*, m. 46°. *2,3,4,6-Tetrabromo-5-iodophenol*, m. 220–1°. C. J. West

Nitrosation of phenols. III. Nitrosation of 4-halogeno-*o*- and *m*-cresols and oximation of the 4-halogeno-2,5-toluquinones. H. H. Hodgson and F. H. Moore. *J. Chem. Soc* **1926**, 2036-40, cf. *C. A.* **20,** 178.—*4-Bromo-o-cresol*, m 78°; *5-nitroso deriv.*, yellow, m 197° (crystd. from C_6H_6 or EtOH), 195° (from hot dil. HCl); mol. wt in freezing PhOH, normal. *4-Iodo-o-cresol*, m. 65°; *5-nitroso deriv*, brown, m. 200° (decompn), mol. wt. in freezing PhOH, normal; reduction gives *4-iodo-5-amino-o-cresol*, m. 170°. *4-Chloro 5-nitroso-o-cresol*, pale yellow, m. 196° (decompn), reduction gives the *5-amino deriv*, m. 217°. *4-Chloro-m-cresol*, m. 45°; *6-nitroso deriv*, yellow to brown, depending upon the solvent, m 187° to 191°; mol wt in freezing PhOH, normal. *4-Bromo-m-cresol*, m. 38°; *6-nitroso deriv*, m 187° to 190°, depending upon the solvent for crystn. *4-Iodo-6 nitroso-m-cresol*, brownish yellow, m 170° (decompn.); reduction gives the *6-amino deriv.*, m. 208°. *4-Chlorotoluquinone-5-oxime*, yellow, m 187° to 191°, depending on the solvent The *4-Br deriv*, yellowish brown, m. 190°. The *5-I deriv*, golden, m. 181° (decompn), from *4-iodo-2,5-toluquinone*, $KMnO_4$ color, m. 92°. C. J. West

Derivatives of homocatechol. I. F R. Graesser-Thomas, J. M. Gulland and Robert Robinson. *J. Chem Soc.* **1926,** 1971-6.—Directions are given for the prepn. of isocreosol, b. 217-8°, m. 35 6°; *Ac deriv*, m. 56-7°, *Bz deriv*, m. 80-1°. HCl and $NaNO_2$ give the *2,6 dinitro deriv*, pale yellow, m. 152-3° (decompn.); it gives a reddish brown color with $FeCl_3$ and an orange soln. in H_2SO_4; *Na salt*, yellow; *Ac deriv*, m. 106°; *phenylhydrazine salt*, orange, m. 109° (decompn), partly hydrolyzed by boiling H_2O; *hydroxylamine salt*, bright orange, becomes pasty at 166°, m 208°. In the nitration of acetylcreosol, there is formed some *2,6-dinitrohomocatechol* (I), yellow, m. 172°, which gives a deep cherry-red color in alkalies and a bluish green color with $FeCl_3$. *2,6-Dinitrocreosol* (II), yellow, m. 108°, is obtained by the hydrolysis of the *Ac deriv.*, m 103°; *quinoline salt*, chocolate-brown, m. 110° (decompn). The *quinoline salt of 3,5,6-trinitroguaiacol*, yellow, m 185° (decompn) Methylation of I or II gives *2,6-dinitrohomoveratrole*, m. 92°. *Anhydrocotarnine-2,6 dinitrohomoveratrole*, orange-yellow, m. 141°; it is decompd. by boiling AcOH. **II.** J. M. Gulland and R. Robinson. *Ibid* 1976 81.—Homoveratrole-6-sulfonyl chloride, m. 75°, in 85% yield from 3,4-$(MeO)_2C_6H_3Me$, $ClSO_3H$ and PCl_5. HNO_3 (d. 1.46) gives 72% of the *5-nitro deriv.*, m 140-1°. Nitration of acetylisocreosol at 5° gives a mixt *5-nitro-3-acetoxy-p-creosol* (?), yellow, m. 104 5°, gives a reddish brown color with $FeCl_3$, and the *Me ether* (?), lemon-yellow, m. 60-1°. Reduction of 2,6-dinitroisocreosol with Na_2SO_3 in alk. soln. gives 25% of *2-nitro-6-aminoisocreosol*, orange-yellow, m. 168-9° (decompn.); the alk. soln. is deep red; $FeCl_3$ gives a green color; *Ac deriv*, m. 183°, crysts with 1 mol. H_2O. Reduction of 2,6-dinitrohomoveratrole with Na_2SO_3 and S gives 85% of a mixt., m. 90–100°, the chief constituent being the *2-nitro-6-aminohomoveratrole* (I), the *HCl salt*, m. 210°, is hydrolyzed by hot H_2O, giving golden yellow needles, m. 90-2°; Ac deriv., m. 173-5°. *6-Bromo-2-nitrohomoveratrole*, buff, m 102°. The action of H_2SO_3 on the diazo-sulfate in the presence of Cu powder gives a *compd.*, $C_{18}H_{19}O_9N_5S$, golden yellow m. 142°; it is stable in boiling 2 *N* NaOH and gives a purple soln. in H_2SO_4, quickly changing to red; a 2nd product is a small amt. of a O_2N acid which, on oxidation and hydrolysis, yields *2-nitro-3-hydroxy-p-tolyl Me ether* (?), m. 62°. Reduction of the diazonium chloride by $SnCl_2$ gives *nitrohydrazinohomoveratrole*, orange, m. 146–66°, whose *piperonylidene deriv.*, orange-yellow, m. 172-3°. I gives a *piperonylidene deriv.*, lemon-yellow, m. 130–2°; hydrolysis gives a I, m. 90–2° and this sample yields a hydrazine, existing in 2 forms, m. 147–9° and 163–4°. C. J. W.

The apiole of anise and its propenylic isomer. Marcel Delépine and André Longuet. *Bull. soc. chim.* **39,** 1019-24(1926).—The apiole (I) ($RCH_2CH{:}CH_2$; R = 2,3,4,5-$(MeO)_2(H_2CO_2)C_6H$—) used was obtained from the oil of *Crithmum maritimum.* With I_2 and HgO in Et_2O, I gave an unstable iodohydrin which with dry KOH

formed the *ethylene oxide deriv.* $RCH_2CH\text{—}CH_2O$, b_{15} 195–200°, which did not yield the aldehyde. In rearranging **I** to isoapiole (**II**), some *2,3,4,5-$(MeO)_2(HO)_2C_6HC_3H_5$*, b_{17} 190–4°, was formed. In Et_2O below 0°, Br_2 and **II** formed the *dibromide* (**III**), RCHBrCHBrMe, m. 105°, reduced to **II** by KI in AcOH, lost HBr readily in alc. or dil. AcMe, and gave with KOAc in AcOH the *diacetate*, m. 124°. The *bromohydrin, ethylene oxide* and *ketone* from **III** were not obtained pure. Br_2 and **II** in AcOH give R′CH-BrCHBrMe (**IV**) (R′ = 6-BrR), reduced by NaI in AcOH to the *6-Br deriv.* of **II**, m. 66°; *picrate*, m. 72°. Boiled 1 hr. with the suitable alc., **IV** yielded *ethers* of **VI**, *Me*, m. 59°; *Et*, m. 82–3°, *Pr*, m. 64°; on longer heating, or at higher temp. (*e. g.* in BuOH) these lost alc. and MeBr, forming *α-methyl-1-methoxy-2,3-methylenedioxy-4-bromobenzofuran* (**V**), m. 108°; *β-Br deriv.* of **V**, m. 151–2°. Heated with H_2O in AcMe, **IV** gave the *bromohydrin* R′CH(OH)CHBrMe (**VI**), m. 125°, and some **V**; *benzoate of* **VI**, m. 132°. KOH in alc. changed **VI** to the *oxide* R′CH.O.CHMe, m. 99–100°, which added AcOH to give the *glycol monoacetate*, m. 121–3°; the corresponding *diacetate*, m. 88–90°, was formed from **IV** and KOAc in AcOH (10 hrs. at 150°).

Ben H. Nicolet

Isomerism of the oximes. XXV. The dissociation constants of some isomeric oximes. O. L. Brady and R. F. Goldstein. *J. Chem. Soc.* **1926**, 1918–24; cf. *C. A.* **20**, 179.—The dissocation consts. were detd. by measuring the degree of hydrolysis of the Na salt by cond. methods. The following mean value of $K_h \cdot 10^5$ (hydrolysis const. of the Na salt) and $K_a \cdot 10^{11}$ (dissociation of the oxime) are reported: α-Benzaldoxime, 47, 2.1, β-deriv., 215, 0.47; α-*o*-NO_2 deriv., 11.5, 8.7; β-deriv., 55, 1.8; α-*m*-NO_2 deriv., 14.3, 7.0, β-deriv., 56, 1.8; α-*p*-NO_2 deriv., 9.3, 10.7; α-2,4-$(NO_2)_2$ deriv., 2.7, 37; α-*o*-MeO deriv., 75, 1.3, α-*m*-MeO deriv., 39, 2.6; α-*p*-MeO deriv., 82, 1.2; α-3,4-$(MeO)_2$, 73, 1.4, α-3,4-methylenedioxy deriv., 74, 1.4. α-Cinnamaldoxime, 36, 2.8, β-deriv., 77, 1.3, α-*m*-NO_2 deriv., 11.5, 6.9. β-Heptaldoxime, 395, 0.25. In all cases the α-aldoxime has a higher dissociation const. than the β-deriv. The β-aldoxime appears to suffer a profound decompn. in contact with the Pt black used on the electrodes and it was impossible to follow the inversion of the β- to the α-aldoxime. *o*-$O_2NC_6H_4$-CH:NOH, warmed with 0.2 *N* NaOH, gives *o*-$O_2NC_6H_4CONH_2$.

C. J. West

Several observations in the saccharin field. Walther Herzog. *Z. angew. Chem.* **39**, 728–9(1926).—1,2,4-$C_6H_3Me(SO_2NH_2)_2$, which may be isolated from the amide residue in the manuf. of saccharin by a fractionation of the Ca salts, results by the action of $ClSO_3H$ which contains some SO_3 upon PhMe, followed by that of NH_3, it m. 190–1°. Oxidation with $KMnO_4$ gives the sulfaminosaccharin. Purification of the residues of the alk. oxidation of *o*-$MeC_6H_4SO_2NH_2$ gives a very bitter *compd.*, $H_2NSO_2C_6H_4CH\text{—}C.NH.SO_2.C_6H_4$, m. 246–7°, *Na salt*. Attempts to synthesize the compd. failed.

C. J. West

Isomeric phenylserines. M. O. Forster and K. A. N. Rao. *J. Chem. Soc.* **1926**, 1943–51.—PhCH(OH)CHN$_3$CO$_2$H (10 g.) and Na_2S in dil. NH_3 give 7.5 g. *cis-phenylserine* (*cis-α-amino-β-hydroxy-β-phenylpropionic acid*) (**I**), m. 230–2° (decompn.); from aq. EtOH the hydrated form seps., m. 213°; $CuCO_3$ gives the sparingly sol. blue Cu salt. **I** also results in 3 g. yield from 5 g. PhCH(OH)CHClCO$_2$H and concd. NH_4OH and is also formed from Na phenyloxyacrylate and NH_4OH. The *N-Bz deriv.*, m. 197°, is sol. in aq. Na_2CO_3; the *O-Me deriv.*, m. 227–32° (decompn.); with $2H_2O$, it m. 215–6°, 1 mol. H_2O being lost after 1 week in a desiccator; the *O-Me N-Bz deriv.*, m. 208° and is sol. in cold Na_2CO_3. The *Et ester picrate*, yellow, m. 170°; the *Et ester picrate* of the *O-Me deriv.* is yellow and m. 155°. The *amide*, m. 199–200°; fusion is followed by the liberation of NH_3 but a cryst. diketopiperazine could not be isolated from the yellow, EtOH-sol. resin. *trans*-Phenylserine, m. 200–2° (decompn.). Heated with Ac_2O this gives acetylaminocinnamic acid lactimide, but **I** does not give this compd. Attempts to prep. a diketopiperazine from **I** have failed to give a cryst. deriv., although the color test with 3,5-$(O_2N)_2C_6H_3CO_2H$ in satd. aq. Na_2CO_3 indicates its formation.

C. J. West

Cleavage of polypeptides composed of amino acids not yet found among the breakdown products of proteins. VII. E. Abderhalden. Cleavage of polypeptides containing *dl*-phenylserine. S. Buadze. *Fermentforschung* **8**, 487–96(1926).—*Chloroacetyl-dl-phenylserine*, m. 155–7°, was obtained by the action of $ClCH_2COCl$ on *dl*-phenylserine; *dl-α-bromoisohexoyl-dl-phenylserine*, m. 115–120°, was similarly prepd. These were converted by the action of NH_3 into *glycyl-dl-phenylserine*, decomps. 188°, and *dl-leucyl-dl-phenylserine*, m. 206°, resp. Both of these dipeptides are hydrolyzed

by yeast maceration juice, as shown by polarimetric detns and also in the glycyl compd. by isolation of the components (cf. *C. A.* **18**, 2903). B. C. A.

Optical activity and the polarity of substituent groups. IV. sec-β-Octyl esters of o-, m-, and p-methoxy- and nitrobenzoic acids. H. G. Rule and Annie H. Numbers. *J. Chem. Soc.* **1926**, 2116–23; cf. *C. A.* **20**, 1800.—The following 1-*β-octyl esters* were prepd.: *o-methoxybenzoate*, b_{13} 187.5°, d_4^{20} 1.0006, $[\alpha]^{20}$ —12 59°, —12.93°, —14.23°, —19.05° for D, yellow, green and violet light (this order is followed below); *m-methoxybenzoate*, b_{12} 187.5°, 0.9945, —35.48°, —37.08°, —42.33°, —73.97°; *p-methoxybenzoate*, b_{13} 189°, 0.9968, —42.88°, —44.90°, —51.38°, —92.07°; *o-nitrobenzoate*, pale yellow, b_{15} 204°, 1.0735, —43 56°, —46.00°, —54.18°, ——; *m-nitrobenzoate*, pale yellow, b_{18} 212°; *p-nitrobenzoate*, pale yellow, m. 29.5–30°. *d-β-Octyl m-nitrobenzoate*, d_4^{20} 1 0758, $[\alpha]^{20}$ 38.61°, 40.31° and 46.25° for D, yellow and green light; *p-deriv.*, d_4^{30} 1 0655, $[\alpha]^{30}$ 42.20°, 44.04° and 46 25°. Densities and rotations are also given for 40°, 60°, 80° and 90°, and rotations for the nitrobenzoates in approx. 5% EtOH soln. The dispersion of the *m*- and *p*-MeO derivs. is normal and apparently simple; the *o*-MeO ester exhibits complex dispersion, which is especially marked at the lower temps. employed and the dispersion of the *o*-NO_2 deriv. also is complex, although the graphs of $1/\alpha$ against λ^2 for the *m*- and *p*-isomers in EtOH approx. very closely to straight lines. Both *o*-derivs. have abnormal dispersion ratios. The influence of substituents is discussed. C. J. West

The dimagnesium derivatives of benzene. G. Bruhat and V. Thomas. *Compt. rend.* **183**, 297–9(1926); cf. *C. A.* **19**, 3085.—These are prepd. from the diiodobenzenes and are decompd. with H_2O to form C_6H_6. The *m*- and *p-di-Mg* derivs. absorb 2 mols. CO_2 and yield *m*-$C_6H_4(CO_2H)_2$ (15%), and *p*-$C_6H_4(CO_2H)_2$ (50%); the *o*-compd. adds 1 mol. CO_2 and gives BzOH. With PhCN, the *o*-deriv. gives *o*-$Bz_2C_6H_4$, m. 148°, and Ph_2CO; the *m*-compd. gives *m*-$C_6H_4Bz_2$, m. 98° (20%); the *p*-compd. forms an unidentified compd. insol. in petroleum ether, m. 160°, and *p*-$Bz_2C_6H_4$ (oxime, m. 256–8°). With aldehydes the *o*- and *m*-derivs. form resins; the *p*-compd. yields $C_6H_4[CH(OH)Ph]_2$, m. 171.5°, and a citron-yellow resin. On condensation with ketones the *o*-deriv. gives $C_6H_4(COHPh_2)_2$, m. 198° (13%); the *p*-compd. forms a glycol, m. 167.5°; the *m*-deriv. forms a product purified with difficulty, m. 213°. This compd. is not the *m*-tetraphenylxyleneglycol described by Stark and Garben (*C. A.* **7**, 1717). This reaction permits the introduction of 2 identical groups in the C_6H_6 nucleus. H. C. Collins

Chemistry of the glutaconic acids. XX. Tetrahydroisophthalic acid. E. H. Farmer and H. L. Richardson. *J. Chem. Soc.* **1926**, 2172–8.—The Δ^2-tetrahydroisophthalic anhydride (Perkin and Pickles, *J. Chem. Soc.* **87**, 293(1905)) and excess EtOH, boiled 3.5 hrs, give a mixt. of 2 *Et H* Δ_2*-tetrahydroisophthalates*, one crystg. at once, m. 44–5°, the other b_1 169 73° and m 40–1°. MeOH gives only 1 *Me H ester*, m. 59°; if this ester is treated with Br and the crude pale yellow dibromide in Et_2O treated with Et_2NH and then reduced with Zn and AcOH, there results a neutral compd., m. 41–3°, and an oily ester, b_1 172–4°, considered an isomeric form of the acid ester. *Me* Δ^2*-tetrahydroisophthalate*, from the Ag salt and MeI, b_7 134–5°; *amide*, m. 239°. When this ester is heated with MeI and MeONa, there results *Me* Δ^3*-tetrahydroisophthalate*, b_7 140–1°. Attempts to prep. the hydroxyanhydride from the Δ^2-acid were unsuccessful. Among the oxidation products of the Δ_2-acid there was isolated a considerable amt. of tricarballylic acid. These facts indicate that the so-called Δ^2-acid is actually the *cis*-Δ^4-acid. C. J. West

Catalytic hydrogenation of carone. S. N. Iyer and J. L. Simonsen. *J. Chem. Soc.* **1926**, 2049–52.—Catalytic reduction of carone (2 mols. H) gives a mixt. of a little *p*-menthane, *p*-menthane 2-ol and *l-p*-menthane-2,8-diol. C. J. West

Preparation of tertiary amino derivatives of tertiary alcohols. Marcel Sommelet. *Compt. rend.* **183**, 302–4(1926).—MeMgI reacts with $Ph_2C{:}NMe$ in Et_2O to give 1-dimethylamino-1,1-diphenylethane (I), b_{17} 167–8°, m. 44–4.5°. I on boiling with Ac_2O decomps. into $Ph_2C{:}CH_2$ (II) and $AcMe_2N$. Treatment of I with a base in $CHCl_3$ or C_6H_6 yields Me_4NI, the HI salt of the base, and **II**. H. C. Collins

Dibenzylacetic acid and some derivatives. Nicola Maxim. *Bull. soc. chim.* **39**, 1024–9(1926).—M. simplifies the method of prepn. of $(PhCH_2)_2CHCO_2H$ (**I**), from $CH_2(CO_2Et)_2$, $PhCH_2Cl$ and EtONa. The acid chloride of I is prepd. and condensed with primary and secondary aryl- and alkylamines to form the corresponding amides. M. obtains the *chloride* of **I**, b_{11} 192°, b_{18} 202°; *amide*, m. 128–9°; *monomethylamide*, m. 89–90°; *dimethylamide*, b_{18} 229°, m. 45°; *diethylamide*, b_{18} 225°, m. 56°; *anilide*, m. 155°, decompd. by sunlight; *o-tolylamide*, m. 134°, decompd. by sunlight; *p-tolylamide*, m.

175°; *α-naphthylamide*, m. 155°; *β-naphthylamide*, m. 145°. The yields obtained are 85% with the acid chloride, and 95% with the amides. C. D. INGERSOLL

Hydrogenation of triphenylcarbinol and of phenylfluorenecarbinol under pressure. V. IPATIEV AND B. DOLGOF. *Compt. rend.* **183**, 304-6(1926). —Ph_3COH (I) on hydrogenation at 230° is transformed into $(C_6H_{11})_3CH$, d^{60} 0.9413, n_D^{60} 1.4919. This phenomenon is not complete at the optimum reaction temp., 275°. At 300°, I decomps., giving an oil from which $(C_6H_{11})_2CH_2$ and dicyclohexyl were isolated. In certain cases Ph_3CH is transformed by heat at 300° to $(C_6H_4)_2CHPh$ (II). II on complete hydrogenation yielded perhydrophenylfluorene. H. C. COLLINS

Catalytic reductions by means of hydrogen and nickel. AUGUSTO FELDMAN. *Giorn. chim. ind. applicata* **7**, 406-8(1925).—Iconogen (Na 1,2,6-aminonaphtholsulfonate) was formed (*a*) by reduction of the NO deriv. of Schäffer's acid ($2,6\text{-}C_{10}H_6(OH)SO_3H$); (*b*) by reduction of $1,2,6\text{-}C_{10}H_5(N:NPh)(OH)SO_3Na$. (This latter compd. is obtained by treating PhN:NPh with $2,6\text{-}C_{10}H_6(OH)SO_3Na$ in presence of NaOH.) Reduction (*b*) takes place with great ease at 60°, and from the reduced liquid $PhNH_2$ may be recovered by distg. with steam. The iconogen may be pptd. by acidifying, after sepn. of the Ni by filtration. The yield is a little less than by method (*a*) and the product is slightly colored, probably as a result of the action of air during distn. *Prepn. of the NO deriv. of Schäffer's acid* (Na 1,2,6-nitrosonaphtholsulfonate): Dissolve 49.2 g. of $2,6\text{-}C_{10}H_6(OH)SO_3Na$ in 300 cc. H_2O at 80°, pour the soln. upon 300 g. ice, agitating well: Schäffer's salt reppts. as very fine crystals. Add 14 g. 100% $NaNO_2$, then, slowly and agitating well, 30 cc. concd. HCl, from a separatory funnel, the stem of which dips below the surface of the liquid. Keep the temp. at 0° by external cooling. Stir for a few hrs., neutralize the excess of acid by lime. To prep. iconogen by method (*a*), introduce the product of nitrosation into a horizontal Ni autoclave provided with a stirring device, together with 20 g. Ni, as catalyzer. Stir the mass in presence of H at about 8 atm., maintaining the temp. at about 90-95°. The absorption of H ceases after 3 hrs. Cool the product of reaction, filter from the Ni rapidly and *in vacuo*. On acidifying the filtrate, iconogen is obtained as beautiful lustrous crystals (about 34 g.). Reduction of 2,4-dinitrophenol gives, according as the reduction is partial or complete, nitroaminophenol or diaminophenol. The presence of nitroaminophenol is often met with in strongly colored liquids obtained from incomplete reduction of the Na salt of dinitrophenol, such solns., diazotized and combined with H acid in a medium made alk. with Na_2CO_3, give "chrome green" used in dyeing. *Prepn. of diaminophenol.*—Place in the autoclave 80 g. dinitrophenol and 500 cc. H_2O. Add 20 g. Ni catalyzer, stir violently in presence of H at 8 atm. The temp. rises to 40°, and remains at this point until the absorption of H ceases. Warm to 50° with a little $Na_2S_2O_4$ and animal charcoal and filter. Acidify the filtrate with H_2SO_4. Reduction in a similar manner of 2,4-dinitro-4'-hydroxydiphenylamine to the corresponding diamino compd. takes place. Quinone reduces to hydroquinol. Methylene *p*-aminophenol, on reduction, does not give the expected base, but regenerates *p*-aminophenol. From this it is probable that no condensation takes place between *p*-aminophenol and HCHO with formation of a double bond between C and N, but that only an addn. product is formed. The reduction of Na formaldehyde sulfoxylate apparently takes place thus: $NaHSO_3.CH_2O + H_2 = NaHSO_2.CH_2O + H_2O$. The absorption of H takes place very slowly, but the filtrate has the property of decolorizing solns. of indigotinsulfonic acid. A mixt. of 1,8,3,6- and $1,5,3,7\text{-}C_{10}H_4(NO_2)_2(SO_3H)_2$ on reduction, behaved in such a manner as to lead to the inference that only the 1,5,3,7-acid undergoes catalytic reduction. R. S. P.

Reactivity of *meso*-substituted anthracenes. III. J. W. COOK. *J. Chem. Soc.* **1926**, 2160-71; cf. *C. A.* **20**, 3292.—Benzylideneanthrone (I) is obtained in 65% yield by boiling 200 g. anthrone, 125 cc. BzH, 500 cc. C_5H_5N and 5 cc. $C_5H_{11}N$ 4 hrs. Reduction of I with Zn dust and Ac_2O gives 9-benzylanthranyl 10-acetate, m. 210-1°; its solns. in AcOH and C_6H_6 have an intense violet fluorescence. I (50 g.) and Zn in NH_4OH give 45 g. 10-hydroxy-9-benzyl-9,10-dihydroanthracene, m. 122-5°; it is completely converted into benzylanthracene (II), m. 133°, on boiling with AcOH; with Ac_2O in C_5H_5N, there probably results an Ac deriv., m. 80°, but this could not be purified. Reduction of I with Zn and AcOH or HCl and with Sn and HCl gave only resinous products. II and 1 mol. Br in CS_2 give the lemon-yellow *10-Br deriv.* (III), m. 144°; 2 or 3 mols. Br give $9,10\text{-}C_{14}H_8Br_2$. III and 2 mols. Br in CS_2 gives a *tetrabromide*, m. 192° (decompn.) (on one occasion an *isomer*, m. 127°, was also isolated), which, heated with EtOH-KOH, gives *2,3,10-tribromo-9-benzylanthracene*, yellow, m. 206-7°; its solns. have a violet fluorescence. II and Br in C_5H_5N give *9-benzyl-9,10-dihydroanthraquinyl-9,10-dipyridinium dibromide*, m. 138-40°, which contains EtOH of crystn.; boiling H_2O gives a resin, boiling $PhNH_2$ or warm dil. mineral acids give *9-benzylanthranyl-10-pyridinium*

bromide, yellow, m. 226° *10-Bromo-9-phenylanthracene*, yellow, m. 154 5°. **II** and Cl in CCl_4 give the *10-Cl deriv.*, yellow, m. 127–8°. SO_2Cl_2 gives this mixed with the 9,10-di-Cl deriv. **II** and HNO_3 give *9-hydroxy-10-nitro-9-benzyl-9,10-dihydroanthracene*, m. 160° (decompn.); with mineral acids in AcOH it gives the *10-nitro deriv.* of **II**, golden yellow, m. 178–80°, also formed by passing NO_2 into **II** in $CHCl_3$. Reduction of **II** with AmONa gives the dihydro deriv. **II**, Bz_2O and $AlCl_3$ in CS_2 give *benzylanthraphenone*, cream-colored, m. 237°; H_2SO_4 gives a cornflower-blue color, changing to dark green, at the same time developing the dark red fluorescence of **II**. Reduction with HI and red P gives the *9,10-dihydro deriv*, yellow, m. 171–2°. *10-Phenylanthraphenone*, cream-colored, m 218–9°. The *9,10-dihydro deriv*, m. 165°. **I** dibromide and Ag_2O in dil. Me_2CO give a *compd.* $C_{21}H_{14}O_2$, m. 133 4°, which gives a magenta color with H_2SO_4 and a blood-red color with NaOH; its *acetate*, m. 140–1°. C. J. West

Action of thionyl chloride on hydroxyanthraquinones. III. Albert Green. *J. Chem. Soc.* **1926,** 2198–204; cf. *C. A.* **20,** 2853.—Purpurin (10 g) and 120 cc. $SOCl_2$, boiled 6 hrs, give 8 5 g *thionylpurpurin*, yellowish brown, m 211–3°, is completely decompd after standing 24 hrs in the air and with AcOH gives the 2-Ac deriv. Anthrapurpurin (10 g.) and 200 cc. $SOCl_2$, boiled 9 hrs, give 14 g. *1,2-thionyl-7-chlorothionylanthrapurpurin* (**I**), ocher-colored, m. 179° (decompn), it decomps. rapidly in air **I** (2 g) and boiling AcOH give 1.5 g *2-acetylanthrapurpurin*, yellow, m 296–8°, *2-Bz deriv*, yellow, m. 203 5°. **I** and Ac_2O give the tri-Ac deriv. Hystazarin (7 g) gives 7 6 g. *thionylhystazarin*, yellowish green, m 200°; AcOH regenerates hystazarin, while Ac_2O yields the di-Ac deriv Anthragallol (**II**) (4 g) gives 3 7 g. *2,3-thionylanthragallol* (**III**), greenish yellow, m 218–20°; it is decompd quant on standing in the air for 10 days **III** and Ac_2O give the 2,3-Ac_2 deriv of **II**; **III** (1 65 g) and 160 cc glacial AcOH give 1 g. **II** and 0 55 g of the *3-Ac deriv* of **II**, golden brown, m. 210–2° *5-Chloro-1-hydroxyanthraquinone*, bright golden yellow, m 223–4°, by hydrolysis of the *1-Ac deriv.*, pale primrose, m. 205° Anthraquinone, the 1-HO, the 4,1- and 5,1-Cl(HO) and the 1,8-$(HO)_2$ derivs are deposited unchanged from $SOCl_2$, even after boiling 48 60 hrs, the 2-HO deriv. also does not react. A table of m. ps of various HO and AcO derivs of anthraquinone is given C J West

Chemistry of the terpenes. III. Synthetic diterpenes and polyterpenes (original investigations). I. Kondakov and S. Saprikin. *Bull. soc. chim.* **37,** 1045–69(1925); cf. *C. A.* **20,** 3164 – In this paper are described the fundamental expts. which clear up the mechanism of the reactions discussed in the earlier papers It had been shown that menthomenthene combines with various halogen derivs, as menthene-HCl, pentene-HCl, etc, to form *hydrogenated* derivs analogous to but not identical with bicyclic diterpenes and monocyclic sesquiterpenes. This suggested the possibility of synthesizing di- and polyterpenes from monoterpenes of definite structure A French spirits of turpentine (**I**), with α_D −32°55′, heated 5 hrs at 60° with 1 mol. of a limonene-HCl (**II**), b_{11} 93 7°, α_D 41°, $d_{17.5}$ 0 980, gave a product yielding on fractionation (1) limonene with very small quantities of pinene and camphene, (2) pinene-HCl (bornyl chloride) (**III**), m 124–5°, α_D −15°7′, $d_{19.3}$ 0 889, and (3) a substance of very high b. p contg. 8–9% Cl, which, after heating with alc KOH or metallic Na, gave a product the greater part of which was a diterpene $C_{20}H_{32}$, b_{11} 174–8°, $d_{17.5}$ 0 933, n_D 1.5308, mol. wt. (f -p method) 259–68. From the higher-boiling fractions were isolated 2 polyterpenes, one a viscous mass, the other a brown colophony-like solid. With 1.5 mols **I** to 1 of **II**, the yield of polyterpenes was not increased, nor with 2 mols **I**, but in this case a larger amt of **III** was formed; on the other hand, the yield of polyterpenes is increased by using 1 5 or 2 mols **II** per mol. **I**. With a highly active *d*-pinene from a Greek turpentine and 1 mol. **II** were obtained a *d*-**III**, $[\alpha]_D$ 23°, and a diterpene, b_{11} 175 8°, α_D 0, d_{21} 0 934, free of higher-boiling products. That the **II** does not combine in these expts. with isomerization products of the pinene was shown by control expts. with camphene, dipentene, terpinolene, terpinene. A *l*-pinene heated 5 hrs with terpineol at 250° gave the same products as were obtained from pinene and **II**. In general, the diterpenes obtained by the earlier methods are, if not absolutely identical, very similar to those obtained by K. and S.'s method. A no of such diterpenes were prepd. by these older methods (*e. g.*, treatment of spirit of turpentine with 96% H_2SO_4). The same polyterpenes have frequently been observed in the esterification of mixts. of pinene and camphene with AcOH-H_2SO_4 (Bertram-Walbaum method), $ZnCl_2$ or $PhSO_3H$. Thus, a *l*-pinene, b. 159–60°, α_D −32°55′, with AcOH-H_2SO_4 at 60–70° yielded dipentene, borneol and terpineol and almost 50% of its wt. of a product non-volatile with steam yielding a fraction, b_{15} 177–84°, α_D −0°8′, $d_{19.5}$ 0.935, n_D 1.51603. Apparently the dipentene (limonene) is not esterified by the AcOH-H_2SO_4, to det. whether it takes part in the polyterpene formation, *pure* limonene, b. 175–9°, was treated in

the same way. The reaction proceeded quite differently; there was no evolution of heat when the H_2SO_4 was added and no homogeneous soln. resulted until the mixt. had been heated a considerable length of time at 60°; the product contained 14% esters (yielding dipentene, terpineol and other substances), and a diterpene, b_{11} 173–8°, α_D 0, d_{20} 0.923, n_D 1.52050. The AcOH-H_2SO_4 method, therefore, differs from that of K. and S. in that in the former the limonene partially polymerizes; the 1st phase in the reaction is the formation of terpineol esters which combine with the limonene to a dihexaacyclic terpene through an intermediate dicyclic compd. after the elimination of the elements of the esterifying acid. As already pointed out by K., the esterification of mixts. of pinene and camphene proceeds quite differently from that of the components alone, the velocity of the addn. of the acid to them not being the same; moreover, in the presence of H_2SO_4, pinene always yields some dipentene and polyterpenes. The results obtained by K. and S. indicate that with the B.-W. method 50% of the pinene is polymerized, 35–40% converted into dipentene and 10% into esters of terpineol, borneol, etc. The formation of camphane shows that a true pinene hydrate is formed during the reaction. The Riban method (treatment with $SbCl_3$) applied to pinene apparently gives almost exclusively polyterpenes, while mixts. of pinene with monocyclic terpenes yield less polyterpenes, some of the monocyclic terpene not being attacked. Similar mixts. of dipentene, di- and polyterpenes were obtained with AlI_3, $AlCl_3$, $FeCl_3$ and BF_3. The b. p., d and *n* of all the diterpenes obtained in this investigation are tabulated. After distn. from Na they are all colorless, almost odorless liquids with a bitter taste, sirupy consistency and light blue fluorescence, gradually become yellow on standing, are excellent solvents for various natural substances (resins, balsams, etc.), absorb Br at low temps. but the resulting products easily lose HBr; they combine with halogen acids, *e. g*, HCl gas at —20° to 20° in Et_2O, C_6H_6, etc, but do not form cryst. or definite compds.; they are not further polymerized by terpene polymerizing agents and give with S no appreciable amts. of retene or its derivs.; they slowly absorb O, decolorize $KMnO_4$ and slowly acquire a camphor odor, are oxidized more energetically by O_3; their reactions indicate that they are not homogeneous but consist of at least 2 isomers, one functioning as an unsatd. diterpene and the other as a satd. hydrocarbon contg. a polycyclic group. The diterpenes regenerated from the halogen compds. have properties different from the original diterpenes. In almost all of their condensation expts, K. and S. also obtained more or less large amts. of triterpene hydrocarbons, b_{11} 235–50° (up to 20% in the expts. with AlI_3); from *l*-pinene with $SbCl_3$ was obtained a product, b_{11} 250–5°, α_D —1°30′ (C_6H_6), $d_{25.6}$ 0.890. Tetraterpenes, m. generally 75–90°, were obtained in all cases. All the diterpenes prepd. from pinene by various polymerization methods are very similar to those obtained from pinene and α-terpineol derivs. by K.'s and S.'s method. Those obtained from monocyclic terpenes with 2 double bonds, and especially limonene, closely approach in phys. properties those obtained from pinene. The synthetic diterpenes differ considerably from the well-studied natural diterpenes; in the former the fundamental groupings of the monoterpene used for the polymerization remain unchanged or undergo an isomerization which does not alter the hexagonal nuclei, while in the natural products the hexagonal nuclei become fused through at least 2 adjacent C atoms with formation of hydrogenated derivs. of $C_{10}H_8$ or phenanthrene. The conversion of synthetic into natural diterpenes and *vice versa* will be taken up in a later paper. The above synthetic diterpenes derived from α-terpineol cannot be converted into true resin acids, as they do not contain a phenanthrene or $C_{10}H_8$ nucleus; a phenanthrene grouping can be obtained from diterpenes with 2 monocyclic nuclei *derived from β-, γ- or other terpineols* The synthetic diterpenes possibly contain trimethylene and cyclobutane groupings. The synthetic polyterpenes are similar to colophony only in appearance and should therefore not be designated as *resins*. C. A. R.

Styrylbenzopyrylium salts. VII. The conversion of 7-methoxy-2,3-dimethylchromone into styrylpyrylium salts. I. M. HEILBRON AND AHMAD ZAKI. *J. Chem. Soc.* **1926**, 1902–6.—7-Methoxy-2,3-dimethylchromone (I) and PhMgBr in C_6H_6 give *7-methoxy-4-phenyl-2,3-dimethylbenzopyrylium chloride*, whose *ferrichloride*, greenish yellow, m. 114°; perchlorate, orange-yellow, m. 206°. This condenses rapidly with aromatic aldehydes in EtOH; *p*-HOC_6H_4CHO gives *7-methoxy-4-phenyl-2-p-hydroxystyryl-3-methylbenzopyrylium chloride*, brick-red, m. 275° (decompn.); *perchlorate*, red. The *p-methoxystyryl deriv.*, red needles; *ferrichloride*, brick-red. The *2-p-hydroxy-m-methoxystyryl deriv.*, glistening, dark green crystals; *ferrichloride*, dark green needles. *2-p-Dimethylaminostyryl deriv*, green; *ferrichloride*, green; *diperchlorate*, yellow, passes into the *monoperchlorate*, dark bluish green, on treatment with solvents. I and *p*-$MeOC_6H_4Br$ give *7-methoxy-4-p-anisyl-2,3-dimethylbenzopyrylium chloride*, orange-

yellow, m. 160°, whose *ferrichloride* is orange-yellow. The *2-p-hydroxystyryl deriv.*, red, forms a red *ferrichloride*. The *p-methoxy chloride* forms red needles, whose *ferrichloride* is brownish red. The *2-p-dimethylaminostyryl deriv.*, olive-green with an intense bronze sheen; *ferrichloride*, green. *7-Methoxy-4-p-dimethylaminophenyl-2,3-dimethylbenzopyrylium chloride*, from I and p-$Me_2NC_6H_4MgI$, dark olive-green giving a purple streak on paper; *perchlorate*, dark purple needles. While this probably forms styryl derivs. with aldehydes, they sepd. as oils. C. J. WEST

Some rearrangements of β-methyl-β'-carbethoxypyrrole. H. FISCHER AND O. WIEDEMANN. *Z. physiol. Chem.* **155**, 52-71(1926).—β,β'-Disubstituted pyrroles are of especial interest for syntheses in the field of blood and bile pigments. The α-position of the pyrrole ring, however, becomes less reactive when both β-positions are occupied, particularly with respect to condensations with CH_2O, H_2CO_2 and $(CHO)_2$. Introduction of an aldehyde group by treatment with HCN and HCl furnished the starting point for the synthesis of a no. of new derivs. Piloty's 3-methyl-4-carbethoxypyrrole-5-carboxylic acid (I) was converted into *3-methyl-4,5-dicarbethoxypyrrole* (II), m. 63°, by esterification with EtOH and HCl; into *3-methyl-4-carbethoxy-5-carbomethoxypyrrole*, m. 59°, by esterification with CH_2N_2; and into *3-methyl-4-carbethoxypyrrole* (III), m. 73°, by heating above the m. p. to expel CO_2. Treatment of III with anhyd. HCN and HCl in Et_2O gave *2-formyl-3-methyl-4-carbethoxypyrrole* (IV), m. 121°, and this by reduction with EtONa and $(NH_2)_2$ at 150-60° was converted into *2,3-dimethylpyrrole; picrate*, m. 146-7°; *phenylhydrazone*, m. 154°; *semicarbazone*, m. 224°; *azlactone*, m. 192°; *oxime*, m. 167°. The oxime when refluxed with Ac_2O and NaOAc gave the *nitrile*, m. 135°, and an acetylated nitrile. Condensation of III with IV by means of concd. HCl gave *bis-[3-methyl-4-carbethoxypyrryl]methene-HCl* (V), m. 195°; *free base* m. 129°. In like manner a *Me deriv.* of V, m. 218°, was obtained from IV and 2,4-dimethyl-3-carbethoxypyrrole. Sapon. of IV with 20% KOH gave *2-formyl-3-methylpyrrole-4-carboxylic acid*, m. 255°, and this when heated *in vacuo* at 190-200° gave *2-formyl-3-methylpyrrole*, m. 95°. *2-Acetyl-3-methyl-4-carbethoxypyrrole* (VI), m. 117°, was obtained by treatment of III in Et_2O with MeCN and HCl and warming the intermediate imine-HCl with H_2O. Reduction of VI by means of EtONa and $(NH_2)_2$ H_2O at 150° gave *2-ethyl-3-methylpyrrole*, isolated as the *picrate*, m. 137°. Sapon. of VI gave *2-acetyl-3-methylpyrrole-4-carboxylic acid*, m 272°; this loses CO_2 when melted and forms *2-acetyl-3-methylpyrrole*, m. 98°. *2-Chloroacetyl-3-methyl-4-carbethoxypyrrole*, m. 115°, was prepd. by treatment of III with $ClCH_2CN$ and HCl and hydrolysis of the intermediate imine-HCl with dil. NH_4OH. A *dimethyldicarbethoxypyrocoll*, m. 168°, was obtained by refluxing I with Ac_2O and NaOAc. The *hydrazide* of I, m. 165°, was prepd. by refluxing II in EtOH with $(NH_2)_2.H_2O$, while further refluxing with excess of the reagent gave *pyrryldiketodiazine*, which sublimes at 190-310° but does not m. 360°. *3-Methyl-4-carbohydrazidopyrrole-5-carboxylic acid*, m. 235°, was obtained by treatment of the K salt of the ester acid with excess of $(NH_2)_2.H_2O$ in EtOH. The following derivs. of the pyrryl-α-acid hydrazide are described: *benzoylhydrazide*, m. 232°; *phenylthiosemicarbazide*, m. 185°; *condensation product with glyoxal*, m. 330°; *condensation product with* II, m. 221°. The hydrazide of I formed a HCl salt which reacted with $NaNO_2$ to yield the *azide*, explosive at 80°. Treatment of the latter with MeOH gave *Me 3-methyl-4-carbethoxypyrrole-5-carbamate*, m. 108°. *3-Methylpyrrole-4,5-dicarboxylic acid*, m. 221°, was prepd. by sapon. of the ester acid. β-Methylpyrrole reacts with MgEtBr and $EtOCOCl$ to yield *2-carbethoxy-3-methylpyrrole*, m. 56°, and this when treated with HCN and HCl yields *2-carbethoxy-3-methyl-5-formylpyrrole*, m. 107°; *semicarbazone*, m. 230°. Distn. of the Ba salt of I converts it into 3-methyl-4-carbethoxypyrrole. A. W. DOX

The methylisoindigotins and methylindirubins. A. WAHL AND TH. FAIVRET. *Ann. chim.* **5**, 314-62(1926); cf. *C. A.* **20**, 758.—Methods are given for prepg. 7- (I) and 5-methylisatin (II). The reduction of II with $NaHSO_3$ gave *7-methyldioxindole*, m. 212°. Similarly 5-methyldioxindole, m. 210°, was prepd. from I. Reduction of these 2 dioxindoles with Na-Hg gave the corresponding methyloxindoles. Isatin was reduced catalytically to *isatide*, which was identified by its *tetra-Ac deriv.*, m. 221°. Similarly the reduction of II gave *5,5'-dimethylisatide*, m. 230-2°. No reduction product could be obtained from I. The condensation of dioxindole with II in the presence of piperidine gave *5-methylisatide*, m. 229-30°. Dioxindole does not condense with I. Oxindole combines with II in the presence of piperidine to give *5-methylisatan*, m. 195-200° (decompn.). Oxindole gives *7-methylisatan*, m. 259°, with I under similar conditions. Oxindole condenses with II in acid soln. to form *5-methylisoindigotin*. The AcOH soln. of the latter heated with Zn gave *leuco-5-methylisoindigotin*. Similarly, oxindole and I in acid soln. gave *7-methylisoindigotin*, which gives *leuco-7-methyliso-*

indigotin on heating in AcOH with Zn. *5-Methylisoindigotinmonosulfonic acid,* m. 310–2° (decompn.), was prepd. by treating 5-methylisoindigotin with concd. H_2SO_4. *7-Methylisoindigotindisulfonic acid* was prepd. similarly from 7-methylisoindigotin. It was characterized by its *Na, K, Ba* and *Ag salts.* Passing H_2S through **II** and **I**, resp., in alc. gave *5,5'*-(**III**) and *7,7'-dimethyldisulfisatide* (**IV**). The action of hot alkali on **III** gave *5,5'-dimethylisoindigotin.* Similarly **IV** gave *7,7'-dimethylisoindigotin.* Treating the latter with concd H_2SO_4 gave *7,7'-dimethylisoindigotindisulfonic acid,* from which the *Na, K, Ba* and *Ag salts* were prepd. Boiling **III** with pyridine gave *leuco-5,5'-dimethylisoindigotin,* m. 330°. On heating **IV** with pyridine, *7,7'-dimethylisoindigotin* was obtained and was reduced to its *leuco deriv.* by Zn in boiling AcOH. *5-Methyloxindole,* m. 168°, was obtained as a by-product from the pyridine mother liquor from which *5,5'-dimethylisoindigotin* had been removed and was identified by giving *benzylidene-5-methyloxindole,* m. 182°, with BzH. Similarly *7-methyloxindole,* m. 203–4°, was obtained from the prepn. of 7,7'-dimethylisoindigotin and was identified by giving *benzylidene-7-methyloxindole,* m. 224°, with BzH. These reactions show that the decompn of the dimethyldisulfisatides by pyridine is identical with that of disulfisatide Four isomeric methylindirubins were prepd. as follows: (1) *7-methylindol-2-indol-3-indigo* by condensing the chloride of I with oxindole; (2) *7-methylindol-3,2-indolindigo* by treating I in alc with indoxylic acid; (3) *5-methylindol-2,3-indolindigo* by condensing the chloride of II with oxindole in C_6H_6, (4) *5-methylindol-3,2-indolindigo* by heating II with indoxylic acid in alc A description of the spectroscopic examn. of the methylisoindigotins and methylindirubins is given together with their absorption curves. R. C. Roberts

Action of benzaldehyde on cyclic ketones containing the groups —CH(CH$_3$)COCHR— or —CHRCOCH$_2$—. R. Cornubert and Ch Borrel *Compt. rend.* **183,** 294 6 (1926); cf *C. A.* **19,** 2933 -α,α'-Methylbenzylcyclohexanone (I), α-methylcyclopentanone (II), thujone (III), tetrahydrocarvone (IV), and carvenone (V) react with BzH to give tetrahydropyrones From I ($C_{25}H_{28}O_2$), m. 191°, II ($C_{20}H_{20}O_2$), unstable form, m. 105°, changes spontaneously to stable form, m 125°; III ($C_{24}H_{26}O_2$), unstable form, m 115°, changes to stable form, m 147°, IV ($C_{24}H_{28}O_2$), m 175° (Wallach, *Ann.* **305,** 266, 270 (1899); V ($C_{24}H_{26}O_2$), m 170–1° (Wallach, *loc. cit*) 3,5-Dimethyl-, 3,5,5-trimethyl-(isoacetophorone), and 3-methyl-5-isopropyl-$\Delta^{2,3}$-cyclohexanone with BzH give benzylidene derivs., m 99–100°, 78°, 91–2°, resp, and high boiling viscous substances. Tetrahydropyrones are not formed with α,α'-methyl-isopropylcyclopentanone, α,α'-dibenzylcyclohexanone or menthone. This reaction shows the existence of the —CHMeCOCHR— or —CHMeCOCH$_2$— groups Differentiation of these groups may be effected by the benzylidene deriv. of the —CHMeCOCH$_2$— group. H C. Collins

Synthesis of pyrylium salts of anthocyanidin type. IX. Some hydroxyflavylium salts. Alexander Robertson and Robert Robinson *J Chem. Soc.* **1926,** 1951–9 — o-HOC_6H_4CHO and 3,4-$(MeO)_2C_6H_3Ac$ in MeOH-KOH give *2-hydroxystyryl 3,4-dimethoxyphenyl ketone,* orange-yellow, m 150–1° to a dark green liquid. HCl in cold abs. HCO_2H converts this into *3',4'-dimethoxyflavylium ferrichloride,* red, with brilliant green reflex, m 196–6 5°. Boiling HI in PhOH, followed by treatment with AgCl in boiling MeOH, gives *3',4'-dihydroxyflavylium chloride,* dark red, hygroscopic needles, crystg. with 0 5 mol H_2O; EtOH-$FeCl_3$ gives an intense purplish violet color; the violet aq. Na_2CO_3 soln is stable for 15 min.; the color is not changed by addn. of NaOH. 2,4-$(HO)_2C_6H_3CHO$ and 3,4-$(MeO)_2C_6H_3Ac$, condensed with HCl, give *7-hydroxy-3',4'-dimethoxyflavylium chloride,* red needles, whose *ferrichloride,* dull, brick-red, m 182–3°. HI in PhOH gives *7,3',4'-trihydroxyflavylium chloride* (*butinidin chloride*), dark red needles with a purple luster; the orange-red EtOH soln. becomes pink on diln. and gives a bluish violet color with $FeCl_3$ o-HOC_6H_4CHO and 3,4-$(MeO)_2C_6H_3CO$-CH_2OMe in AcOH, satd with HCl, give *3,3',4'-trimethoxyflavylium chloride,* red needles with a golden green reflex, whose *ferrichloride,* dark reddish crimson, m. 173°. *3,3',4'-Trihydroxyflavylium chloride,* dark brown needles with 1 5 mols H_2O, very hygroscopic and gradually acquires a dull green reflex. $FeCl_3$ in EtOH gives a purplish violet color. Aq Na_2CO_3 gives a reddish purple soln., which quickly fades. The addn. of NaOH to an acid soln gives almost at once a yellow liquid. 2,4,5-$(HO)_2MeC_6H_2CHO$ and 3,4-$(MeO)_2C_6H_3COCH_2OMe$ in HCO_2H, satd. with HCl, give *7-hydroxy-3,3',4'-trimethoxy-5-methylflavylium chloride,* dark red prisms, whose *ferrichloride,* reddish brown, m. 182–3°; it exhibits a golden green streak when rubbed on glass. *3,7,3',4'-Tetrahydroxy-5-methylflavylium chloride,* crimson needles with a brilliant green reflex, crystg. with 0.25 mol. H_2O, sparingly sol. in 1% cold HCl and 10% hot HCl. *6,4'-Dihydroxyflavylium chloride,* orange-red, crystg. with 1 mol. H_2O. Aq. NaOH or Na_2CO_3 gives

a stable, bright crimson color. *6,3',4'-Trimethoxyflavylium ferrichloride*, dull red, m. 186°. *6,3',4'-Trihydroxyflavylium chloride*, dark crimson with bluish purple luster; $FeCl_3$ gives a purplish violet color; the purplish blue aq. Na_2CO_3 soln. is stable. *3,6,3',4'-Tetramethoxyflavylium ferrichloride*, dark red, m 198–9°. *3,6,3',4'-Tetrahydroxyflavylium chloride*, dark red plates with brilliant green glance; the eosin-red EtOH soln. gives a violet-blue color with $FeCl_3$; the aq. Na_2CO_3 soln. is reddish blue, while in EtOH-Na_2CO_3 the color is only a $KMnO_4$ color. *8,3',4'-Trimethoxyflavylium ferrichloride*, dark red, but appears green in mass because of the brilliant reflex, m. 193–4°; this series could not be demethylated. The corresponding *3,8,3',4'-tetramethoxy deriv.*, dark red, m. 162–3°; *3,8,3',4'-tetrahydroxyflavylium chloride*, dark red, very hygroscopic needles, crystg. with 1 mol H_2O; the orange-red EtOH soln becomes purplish violet with $FeCl_3$. Na_2CO_3 or NaOH gives purplish red colors which are unstable **X. Delphinidin chloride 3-methyl ether.** ELIZABETH STEWART GATEWOOD AND R ROBINSON *Ibid* 1959–67. —2,4-$(AcO)_2C_6H_3COCH_2OMe$ and 2,4,6-$(AcO)_3C_6H_2CHO$ in HCO_2H, condensed with HCl, give *morinidin chloride 3-Me ether*, bright red, darkens above 200°, does not m 290°; in H_2O pseudo-base formation is slow Its reactions are compared with those of morinidin. *3,4,5-Trimethoxyphenyl 2-hydroxy-4,6-dimethoxystyryl ketone*, bright yellow, m. 151–2°, in 10 g. yield from 6 g. 3,4,5-$(MeO)_3C_6H_2Ac$ and 5 g. 2,4,6-HO-$(MeO)_2C_6H_2CHO$, acid readily transforms this into *5,7,3',4',5'-pentamethoxyflavylium chloride*, red, m. 150°; the corresponding base is a relatively strong one and the acetate and H-carbonate are stable in cold H_2O *Perchlorate*, brick-red; *ferrichloride*, crimson, m. 199 201°; *mercurichloride*, insol in boiling dil. HCl contg $HgCl_2$. HI and PhOH split off 4 MeO groups, giving *7(or 5),3',4',5'-tetrahydroxy-5(or 7)-methoxyflavylium chloride*, red needles or plates, blackens above 200°; it crysts with 1 H_2O. The product from 30 g 3,4,5-$(AcO)_3C_6H_2COCl$ and the Na deriv. of 18 g $MeOCH_2COCH(OMe)$-CO_2Et, extd with Et_2O, gives 2 2 g, sol. in Et_2O, considered to be *3,4,5-triacetoxy-ω-methoxyacetophenone*, m 132–3°, which shows no tendency to condense with aldehydes (HCO_2H and HCl), BuOH then exts 12 g of an oil, which condenses with 2,4,6-$(AcO)_3$-C_6H_2CHO to give *5,7,3',4',5'-pentahydroxy-3-methoxyflavylium chloride*, deep chocolate-brown with green reflex, crystg with 2 mols. H_2O The salt is practically insol. in cold 0.1% HCl and very sparingly sol in boiling 1% HCl HI in PhOH gives delphinidin chloride If this be delphinidin chloride 3-Me ether, as is assumed, then myrtillidin chloride or petunidin chloride is pure delphinidin chloride 3'-Me ether and the other is either the same substance in a less pure condition or has a MeO group in position 5 or 7 in the phloroglucinol nucleus Malvidin is provisionally assumed to be delphinidin 3',5'-Me_2 ether. **XI. A synthesis of peonidin chloride.** THOMAS JOSEPH NOLAN, DAVID DOIG PRATT AND R ROBINSON *Ibid* 1968–71 —*ω-Acetoxy-4-hydroxyacetophenone*, m. 127°, from the ω-Cl deriv. and AcOK; further action of cold AcCl gives *ω,4-diacetoxyacetophenone*, m. 98°. Condensed with 2,4,6-$(AcO)_3C_6H_2CHO$ and the Ac groups removed by hydrolysis, there results pelargonidin chloride, but the yield is very poor. *ω-Acetoxy-3-methoxy-4-hydroxyacetophenone*, m 110°; the *ω,4-di-Ac deriv*, m. 73° With 2,4,6-$(AcO)_3C_6H_2CHO$ and either Ac deriv there results peonidin chloride

C. J. WEST

Piperitone. VIII. The condensation of piperitone with aldehydes. J. C. EARL AND JOHN READ. *J. Chem Soc.* **1926**, 2072–6; cf *C. A* **18**, 980.—*Anisylidene-dl-piperitone*, pale yellow, rhombic normal crystals, m. 98°; $a:b:c$ = 0 91900 1 0 82044; other crystallographic data are recorded; no dimorphism was observed; yield, 12.8 g. from 10 g *dl*-piperitone. If the condensation is carried out in concd. HCl, only 12% of this yield is obtained; the *l*-deriv is racemized during the condensation. *Salicylidene deriv*, pale yellow, m 177°; the NaOH soln is orange-yellow. Reduction with Zn dust and alkali appears to give 2 isomeric dihydro derivs., $C_{17}H_{22}O_2$. *Piperonylidene deriv*, pale yellow, m 128°. *Opianylidene deriv*, pale yellow, m. 157°, *Ca salt*. Oxidation of the benzylidene deriv, with $KMnO_4$ in Me_2CO gives α-isopropylglutaric acid, m. 94°, indicating that the condensation occurs in position 7 and not in position 6, as previously assumed

C J. WEST

Derivatives of 1-benzyltetrahydroisoquinoline. ROBERT ROBINSON AND HELEN WEST. *J. Chem. Soc.* **1926**, 1985–7.—Reduction of 5 g. anhydrocotarnine-2,4-dinitrotoluene with $SnCl_2$ and Sn in HCl and AcOH gives 3.8 g *anhydrocotarnine-2,4-diaminotoluene*, m. 119°; the dil. HCl soln. gives an orange ppt. with $NaNO_2$, but the soln. contains a tetrazonium salt and couples with β-$C_{10}H_7OH$ to give a vermillion azo compd. *Di-Ac deriv.*, m 211°. Cotarnine and 2,4,3-$(O_2N)_2MeOC_6H_2Me$ (m. 86°) condense with MeONa to give 91% of *anhydrocotarnine-2,4-dinitro-3-methoxytoluene*, bright yellow, m 136°; *HCl salt*. The base is slowly decompd. by boiling AcOH *Anhydrohydrastinine-2,4,6-trinitrotoluene*, brilliant orange-yellow, m. 143° (explosive decompn); yield,

94%. The sparingly sol. *HCl salt* decomps. on boiling in H_2O. The base is quickly decompd. by boiling AcOH. C. J. West

Synthetical experiments in the phenanthrene group of the alkaloids. I. Robert Robinson and Junzo Shinoda. *J. Chem. Soc.* **1926,** 1987–95.—1-Hydroxy-6,7-dimethoxy-2-methyl-1,2,3,4-tetrahydroisoquinoline is termed "laudaline." "Lodal" (a trade prepn. contg. 82.4% of laudalinium chloride) and 2,4,3-$(O_2N)_2MeOC_6H_2Me$ with MeONa give 88% of *anhydrolaudaline-2,4-dinitro-3-methoxytoluene* (I), orange-yellow, m. 111–2°, which is reduced by $SnCl_2$ in HCl to the *2,4-di-NH_2 deriv.*, whose *di-HCl salt* m. 236–7°. Attempts to prep. the Ac and Bz derivs. failed. Reduction of I with NH_3 and H_2S gives the *4-NH_2 deriv*, yellow with 0.5 C_6H_6, m. 145°; *Ac deriv.* (II), pale yellow, m. 151°; if the NH_2 deriv. is heated with Ac_2O, there results a *compd.*, m. 194°, assumed to be $(MeO)_2C_6H_2(CH_2CH_2NMeAc)CH(OAc)CH_2C_6H_2(NO_2)$-(OMe)NHAc. *Anhydrocotarnine-2-nitro-4-amino-3-methoxytoluene,* yellow, m. 184°; *Ac deriv.* (III), pale yellow, m. 134°, crysts. with 1 H_2O. *2-Nitro-3-methoxy-p-toluidide-HCl,* m 205°; *Ac deriv.*, pale yellow, m. 108–9°. Oxidation with $KMnO_4$ in $MgSO_4$ soln. of III under the same conditions gives *2-nitro-4-acetylamino-3-methoxybenzoic acid,* m. 228–9°. Reduction of II with Fe in AcOH or with H ($PdCl_2$ in AcOH) gives *anhydrolaudaline-2-amino-4-acetylamino-3-methoxytoluene,* sinters 105°, m 110°, whose *picrate,* bright yellow, m. 168–9°. Diazotized and treated with Cu powder it gives *dehydro-anhydrolaudaline-4-acetylamino-3-methoxytoluene,* analyzed as the *methiodide,* sinters 205°, m. 210° (decompn); H_2SO_4 gives a violet color, changing to pink on heating. *Isoapomorphine di-Me ether methosulfate,* m. 246°, gives a royal blue color with Frohde's reagent. Boiling with NaOH gives *6,7-dimethoxy-1-[β-dimethylaminoethyl]-phenanthrene,* m. 111°; *HCl salt,* needles. The base develops with Fröhde's reagent an intense green color and dissolves in H_2SO_4 with a bright pink color, which quickly disappears; addn. of a drop of Mandelin's reagent then produces an ivy-green color. C. J. West

Conessine. D. D. Kanga, P. R. Ayyar and J. L. Simonsen. *J. Chem. Soc.* **1926,** 2123–7.—Conessine is obtained in 1% yield from *H. antidysenterica;* crystd. from Me_2-CO it m. 125°; it is not attacked by H_2SO_4 and MnO_2 but is converted by $Hg(OAc)_2$ in AcOH into a base crystg. in needles (not investigated). The dimethiodide, shaken with Ag_2O and the aq. soln. heated at 200° under reduced pressure, gives *apoconessine,* $C_{22}H_{33}N$, m. 68.5°; the port wine-colored H_2SO_4 soln. becomes colorless on diln. with H_2O; HNO_3 gives a deep red soln., rapidly changing to yellow. The *acid H_2SO_4 salt* crysts. with 7.5 mols. H_2O, m. 107–8°; 3.5 mols. H_2O are lost in a vacuum and the salt then does not completely m. 280°; *picrate,* yellow, m. 110–1°; *methiodide,* sinters at 245° to a viscid resin which clears at 283–5°; Ag_2O regenerates apoconessine. The mother liquors of apoconessine yield a *base,* pale yellow, b_{11} 253–5°, which was not investigated. *Conessine dimethosulfate,* softens 225°, m. 240–2°; KOH gives a very hygroscopic base, whose *dipicrate,* yellow, m. 258–9° (slight decompn.); *dimethiodide,* does not m. 290°. The oil obtained as a by-product in the prepn of the methosulfate, on treatment with KOH, yields a *compd.,* m. 253–4°, whose *picrate,* yellow, decomps. about 256°. C. J. West

Acid constituents of the resin of the piñon pine (Pinus pinea). G. Dupont and J. Dubourg. *Bull. soc. chim.* **39,** 1029–36(1926).—A relation has previously been indicated (*C. A.* **19,** 648) between the terpenes and the resin acids present in a given species. The terpene of the piñon pine is limonene. A cold alc. ext. of the galipot was fractionally pptd. with H_2O, yielding a large fraction of *pineic acid* (I) (new), m. 119–20°, $[\alpha]_D$ —113.3°, soly. 19.3 g. in 100 cc. 96% alc. at 15°, and very similar to alepic and saponic acids. When I is warmed in alc. contg. 1% HCl, $[\alpha]_D$ falls to —25.3°, then rises, the final product being abietic acid. The intermediate product, isomorphous with abietic acid, m. 153–4°, $[\alpha]_D$ —25.3, is called *pineabietic acid.* It may be identical with alepabietic acid. Ben H. Nicolet

Some reactions of glycyrrhizin. P. Bertolo *Giorn. chim. ind. applicata* **7,** 404–5(1925).—Glycyrrhizin [I], besides having a glucoside nature, behaves very similarly to atractylin, the active principle of *Atractylis gummifera. Prepn. of pure* I: Treat NH_4 glycyrrhizinate with $CdCl_2$ soln. The ppt. coagulates into a pasty mass which hardens and becomes friable on cooling. Wash repeatedly with boiling H_2O. Suspend in alc., decomp. with H_2S, filter, evap. the soln. Cryst. several times from AcOH. Dry at 100°. I gives the following reactions: (1) It dissolves in concd. H_2SO_4 with a yellow color, which, on slight warming, becomes a violet-red, and a gray powder seps. out on standing. (2) Add a drop of aq. piperonal to I in H_2SO_4; a wine-red color is produced, which slowly becomes violet and the liquid slightly turbid. Use solid instead of aq. piperonal, and allow it to slide along the walls of the glass vessel; at the

points of contact with the H_2SO_4, a greenish color forms at first, which on slight heating passes to red and finally to an intense violet, which diffuses into the whole mass and persists for several hrs. (3) Using similarly crystals of vanillin, a beautiful violet-red color forms at the points of contact and diffuses through the mass on agitating, then persists for some days. (4) Add a drop of *o*-HOC_6H_4CHO to I in H_2SO_4; blood-red color is produced, slowly changing to violet. (5) With *p*-$MeOC_6H_4CHO$ there is obtained at once a violet color, which at first changes to red and finally returns to a persistent violet. (6) With PhCH:CHCHO there forms at once an intense red color with turbidity of the liquid, and the color slowly turns to an intense violet; on warming the color becomes greenish. (7) No special color is produced by BzH or by $O_2NC_6H_4CHO$, but warming gives a brown-red color; formalin acts similarly. (8) Glucose slowly produces a violet color. (9) Furfural gives at once a beautiful violet color, which becomes more and more intense on standing, tending to an azure. Thus I in its behavior towards H_2SO_4 manifests its glucoside nature. Therefore reactions intended to recognize and differentiate atractylin in the presence of I should be based essentially upon identification of the valeric and the SO_3H groups contd. in its mol., and not in the mol. of I. ROBERT S. POSMONTIER

Saponins. IV. The oxidation of hederagenin methyl ester. W. A. JACOBS AND E. L. GUSTUS. *J. Biol Chem.* **69**, 641-52(1926).—CrO_3 in AcOH reacted on hederagenin Me ester to form a ketone, $C_{31}H_{48}O_3$, and a mono-Me ester of a dibasic keto acid, $C_{31}H_{48}O_5$. The acid crystd. from 50% alc. in long needles, m 133-5°. Its di-Me ester, $C_{30}H_{46}O_5$, obtained by refluxing the acid with MeOH and H_2SO_4, m. 161-3°. By refluxing equiv. amts. of the acid, NH_2OH HCl, and NaOAc in alc., the oxime of the acid, $C_{31}H_{48}O_5$, was obtained in needles which soften 160° and m about 180°. The ketone, $C_{31}H_{48}O_3$, formed in the original oxidation of the hederagenin Me ester, m. 208-10°. An identical ketone was obtained by oxidizing hederagic mono-Me ester with CrO_3. Its oxime, m. 198°. On reduction by Clemmensen's method, $C_{31}H_{50}O_2$, m. 190-1°, was formed. On longer heating a mixt. of unknown substances was formed. On oxidation with CrO_3, this ketone formed a diketone, $C_{31}H_{46}O_4$, m. 238-40° after preliminary softening. Its mono-oxime, $C_{31}H_{47}O_4N$, m. 156-8° (decompn.). Reduced by Clemmensen's method, the diketone formed long prisms, m. 186-8° with preliminary softening, isomeric with the reduction product of the above described ketone, $C_{31}H_{48}O_3$. The hydroxyketone, $C_{31}H_{48}O_4$, isolated from the mother liquors of the diketone, $C_{31}H_{46}O_4$, m. 215-6° with sintering. Its oxime, $C_{31}H_{49}O_4N$, softens 170° and becomes completely fluid 200°. Reduced by Clemmensen's method the hydroxyketone forms $C_{31}H_{50}O_3$, m. 180-2°. ARTHUR GROLLMAN

The chemistry of lignin. PETER RUŠNEV. *Centralb. gesam. Forstw.* **49**, 281-94(1923); *Botan. Abstracts* **15**, 627.—The work of various investigators on the origin, compn., and detn. of lignin in wood is summarized as follows: Lignin is probably synthesized from the pentosans and hexosans, and is probably in chem. rather than merely mech combination. It is not a uniform substance, but in woods of conifers probably consists of α- and β-lignin in the ratio 2:1. It may be a deriv. of coniferyl alc.; in conifers, α-lignin probably consists of 2 mols. of coniferyl aldehyde, and β-lignin of 1 mol. of coniferyl aldehyde and 1 of caffeic acid. The lignin content of wood varies within rather narrow limits (broad-leaved species 20-26%, conifers 28-29%). The so-called lignin color reactions are not lignin reactions, but merely show the degree of purity of cellulose. Detn. by the MeO method is impossible. A long list of references is cited. H. G.

Complex ferro salts (KÜSTER) **6**. X-rays and organic compounds with long chains (TRILLAT) **2**. The electrolytic oxidation of *p*-BrC_6H_4Me and of *o*-$O_2NC_6H_4Me$ (CONN, LOWY) **4**. The crystallography and optical properties of bromotyrosine (ZARTNER) **2**. Alcohol and organic acids from fermentation residues (U. S. pat. 1,599,185) **16**.

MOUREU, CHARLES: **Notions fondamentales de chimie organique.** 55 quai des Grands-Augustins, Paris: Gauthier-Villars & Cie. 554 pp. F. 35.

NOYES, WILLIAM ALBERT: **Organic Chemistry.** New York: Henry Holt and Co. 677 pp. $3.50. Reviewed in *J. Franklin Inst.* **202**, 393; *Chem. News* **133**, 126(1926).

Rectification of acetic acid. G. F. LEGENDRE. Can. 258,628, Mar. 2, 1926. A continuous rectification of crude acids in which, if the concn. is great the rectification is carried out in such a way as to have crystallizable acid at the base of the rectifier,

while the small particles of water at the top are rectified again for recuperating the acid lost and sending it to the rectifier; if the crude acid is poor the operation is reversed, the supply being made in the recuperating column, which produces only a preliminary concn., the concd acid then passes into the rectifier.

Concentrated acetic acid. H. SUIDA. Can. 259,147, Mar. 23, 1926. Concd. AcOH is extd. from dil. AcOH with solvents insol. in water which dissolve AcOH and have a higher b p. than that of pure AcOH, the AcOH is sepd. from the solvent in a degree of concn. suitable for direct conversion into glacial AcOH, and the solvent deprived of AcOH and left behind during the distn. is returned to the extn. process Cf. *C. A.* **19,** 3272

Butyric acid. C. O YOUNG. U. S 1,599,737, Sept. 14 Butyraldehyde is introduced into a reaction chamber contg. an oxidizing atm. maintained at a temp above the b. p of butyraldehyde at the prevailing pressure but low enough to cause a liquid contg butyric acid to be formed. The liquid is collected at a point in the chamber remote from the point of introduction of the aldehyde and butyric acid is recovered from it Cf. *C. A.* **19,** 657.

Combining ethylene with sulfuric acid. J N COMPTON U S 1,598,560, Aug. 31. A bath is prepd. contg 20-90 mols C_2H_4 per 100 mols SO_3, C_2H_4 is absorbed in the bath and acid is added as required to maintain the compn of the bath within the specified limits and obtain a soln adapted for producing alc by hydrolyzing.

Fixing ethylene by sulfuric acid. A A L. J. DAMIENS, M. C. J. E. DE LOISY AND O. J. G PIETTE U S 1,599,119, Sept 7 In order to form neutral Et_2SO_4, a catalyst such as $FeSO_4$ or Cu_2SO_4 is used with H_2SO_4 of at least 97% strength, and a gaseous current contg C_2H_4 is passed through the acid at a temp. of 0-15°, the catalyst is sepd. from the acid, *e g*, by centrifuging or filtration and the acid is dild. and the neutral Et_2SO_4 which floats on the acid is collected Cf *C. A.* **20,** 1415

Ethylidene diacetate. M E. BOUVIER and L. HUGONIOT Can. 262,826, July 20, 1926. C_2H_2 is absorbed in $HC_2H_3O_2$ in the presence of $HgSO_4$, sulfoacetic acid and Ac_2O, at a temp of 80-90°.

Acetone. K. ROKA Can. 262,932, July 27, 1926. AcH and water vapor are caused to react at higher temp in the presence of catalysts

Methanol and acetone. C H SHAW and H A MINER. Can. 262,267, June 29, 1926 A fluid contg CH_2Cl_2 and constituents that vaporize at lower temp. is heated to drive off such constituents. The heat is of a degree less than that at which the CH_2Cl_2 would boil.

1-Arylimino-2-naphthoquinones. A. WAHL and R. LANTZ. U S. 1,599,444, Sept. 14. These products are prepd. by action of NaOCl or other suitable oxidizing agent on 1-arylamino-2-hydroxynaphthalenes. They are generally dark green crystals, insol. in H_2O, sol. in ether and acetone and can be used in *prepg dyes.*

Tetrazoles. K. F SCHMIDT. U. S 1,599,493, Sept 14. Hydrazoic acid is caused to act, in excess, on carbonyl compds. such as acetone, cyclohexanone or benzophenone in the presence of H_2SO_4 or other concd inorg acid.

Anthracene-2, 1-thioindoxyl. R. STOCKER and J. MÜLLER. U S 1,598,167, Aug. 31. This compd. is obtained as a yellow powder, insol in H_2O, sol. in dil. alkalies and in alc., acetone and C_6H_6, crystg from alc as yellow needles, m 172°; and may be formed by condensing a halide of 2-anthracenethioglycolic acid by acid condensing agents such as $AlCl_3$, $FeCl_3$ or $ZnCl_2$.

Normal butyl nitrolactate. C. E BURKE and R. L KRAMER. U. S 1,598,474, Aug. 31. CH_3 $CH(O\ NO_2)$ $COOC_4H_9$ is formed by nitrating butyl lactate It is suitable for colloiding nitrocellulose as are also the similar amyl, hexyl and cyclohexyl nitrolactates.

Phthalic anhydride. H. D. GIBBS. U. S. 1,599,228, Sept. 7. $C_{10}H_8$ vapor and air or other O-contg. gas are passed through a plurality of relatively small catalytic reaction zones contg V_2O_5 or other suitable oxidation catalyst at a temp. of 400-600° and rapid dissipation of excess heat is effected by maintaining the zones in contact with a medium of high heat cond such as $NaNO_3$ and KNO_3 which may surround tubes contg. the catalyst. Cf. *C. A.* **20,** 3171.

Sulfohalogenamides. FARBENFABRIKEN VORM F. BAYER & CO. Brit. 241,579, Oct. 18, 1924. *p*-Toluenesulfonamide is stirred with H_2O, bleaching powder and Na_2CO_3 and, after heating and sepg. pptd. $CaCO_3$, crystals of Na *p*-toluenesulfochloramide sep. on cooling. Na_2SO_4 may be used instead of Na_2CO_3 and other sulfohalogenamides may be similarly obtained. Brit. 241,580 specifies similar reactions for the prepn. of bleaching, washing and disinfecting compns.

Camphor. H. D. GIBBS and A. W. FRANCIS. U. S. 1,597,877, Aug. 31. Iso-

borneol 1 g. in the gaseous state, mixed with air 0.5–10 l (measured at 20° and 760 mm pressure), is subjected to the action of an oxidation catalyst such as oxide of V, Mo or Cr at a temp. between 200° and 600° (usually about 300° with V_2O_5) to form camphor

Perylene halogenating process. A. Pongratz and A. Zinke. Can. 262,050, June 22, 1926. Perylene derivs. are dissolved in a solvent and a halogen compd. is gradually introduced into the soln. and at the same time a substance capable of liberating the halogen from this compd

Aldols. C J. Herrly. U. S. 1,598,522, Aug. 31. In making an aldol from AcH or other aliphatic aldehyde contg. a plurality of C atoms, there is added to the substantially neutral aldehyde about 0.01–1 10% by wt. of caustic alkali and reaction is permitted to proceed for a time at a temp. above 20°.

Pyridine substitution products. K. Rath. Can. 259,767, Apr. 13, 1926. Diazo solns of pyridine or its derivs are caused to react with substances which contain the substituents to be introduced, *e. g*, halogens or the cyanogen group.

Hydrolysis of esters. E. E. Ayres and E. H. Haabestad. Brit. 241,889, Oct 21, 1924 AmCl is heated with NaOH and Am oleate and the latter is probably continuously decompd. by the alkali to form AmOH and Na oleate and regenerated by interaction of the Na oleate and AmCl. AmOH is distd. off and dihydroxypentane is obtained as the only by-product. It is stated that a similar process may be applied to the treatment of halogen derivs. of fatty and aromatic hydrocarbons and of mercaptans and org. sulfides.

New derivatives of organic arsenic compounds. J. Pfleger and A. Albert Can 259,867, Apr. 20, 1926. Org As compds. of a mixed aliphatic-aromatic type, which contain carbonyl groups in non-cyclic linkage, are caused to react with hydrazine derivs of org. carbonyl compds

Absolute alcohol. E A Barbet. U S 1,598,548, Aug 31. Aq. alc is treated with a dehydrating agent such as CaO and a portion of the alc. is distd. from the mixt. The residual portion is dild with H_2O and distd to obtain aq. alc. for further treatment

Purifying crude alcohols. R. de M. Taveau. U. S 1,600,437, Sept. 21 Crude alcs such as those derived from cracked petroleum gases are distd. over non-aq. alkali, *e g*, solid NaOH.

Phosphoric esters of multivalent alcohols. P. E. Goissedet and A. L. Husson U S 1,598,370, Aug. 31. Glucose or other multivalent alcs. are treated with P_2O_5 in the presence of tertiary bases such as pyridine and the esters formed are sepd. from the reacting medium by pptn as Ca salts.

Styrene, etc. I Ostromislensky. Can 261,326, June 1, 1926. Styrene or its homologs are made by heating a substance having the general formula Ar CH·CH - COOH at approx 250° to 650°, exclusive of the temp. range 300° to 500° and partially decompg. the substance to form a substance having the formula Ar CH.CH_2. Cf. *C A* **20**, 424, 1243

Styrene, etc. I. Ostromislensky and M. G. Shephard Can 261,327, June 1, 1926. Stabilized styrene is made by combining styrene with quinone. Cf. *C. A.* **20**, 424

Styrene, etc. I. Ostromislensky and M G. Shephard Can 261,325, June 1, 1926. Styrene or its homologs are made by heating a hydrocarbon of the general formula Ar CH_2CH_3 to a temp. of approx 450° to 700° and partially decompg. the hydrocarbon to form a compd. of the general formula Ar CH·CH_2.

11—BIOLOGICAL CHEMISTRY

PAUL E. HOWE

A—GENERAL

FRANK P. UNDERHILL

Effect of ion combinations on protoplasm, ameboid movement, tissue formation in experimental amebocyte tissue. L. Loeb. *Proc. Soc. Exptl. Biol. Med.* **23**, 57–60 (1925).—The consistency of the cell dets. the nature of ameboid movement, the character of the pseudopods, agglutination, rapidity of growth and secondary degeneration in ameboid tissue. The consistency is detd. by natural tendencies, by the physical condition of the environment, and by the chem. constitution of the fluid surrounding the cell. Nitrate tends to cause softening; sulfate hardens the cell; chloride exerts an intermediate effect. H ion increases the consistency. Sulfate counteracts the

softening effect of low concns. of K more effectively than does chloride, while nitrate intensifies the softening effect. KNO_3 will neutralize the effect of Na_2SO_4 more completely than does KCl. Cell phenomena can be predicted from a knowledge of the ion combinations in the surrounding fluid. C. V. B.

An unidentified base among the hydrolytic products of gelatin. D. D. VAN SLYKE AND W. ROBSON. *Proc. Soc. Exptl. Biol. Med.* **23,** 23(1925).—Further prepns. of the base isolated by Van Slyke and Hillier have been studied. The Cu salt seems to be $(C_7H_9O_4N_2)_2Cu$. The substance gives the reactions for a pyrrole group. The ratio 1 : 2 for amino N: total N is confirmed. It may be a dihydroxypyrrole-alanine. C. V. B.

Decolorization by acids and alkalies of amebocytes and of filter paper stained by neutral red. L. LOEB AND I. PIEPER. *Proc. Soc. Exptl. Biol. Med.* **23,** 60-2(1925).—In both amebocytes and filter paper, acid and alkali solns. behave oppositely in the extn. of acid and alk. dyes. NaCl decreases the extn. of neutral red by strong concn. of acid, and in some cases when alkali is used in the decolorant. The conditions detg. the staining of cell granules and of filter paper are not identical. C. V. B.

Cozymase. VIII. E. JORPES, H. V. EULER AND R. NILSSON. *Z. physiol. Chem.* **155,** 137-55(1926); cf. *C. A.* **20,** 211.—Ext. from lactic-acid bacteria, whether prepd. at room temp., 40°, 90° or 100°, acts upon apozymase (washed dried yeast) in the same manner as cozymase. Pancreas insulin is not capable of replacing cozymase in the zymase system; insulin is therefore not identical with yeast cozymase. Conversely, yeast cozymase does not exert the typical insulin action on rabbits or mice. Likewise the aq. ext. of lactic-acid bacteria, regardless of the temp. at which it is prepd., while strongly activating toward apozymase, has no typical insulin action on mice. A. W. DOX

Reply to the comment of R. Weiss on my work "The horn-dissolving action of alkali sulfides." PAUL PULEWKA *Z. physiol. Chem.* **155,** 156(1926); cf. *C. A.* **20,** 3017.—Polemical. A. W. DOX

The reaction chain hexose ⇌ lactic acid in lactic-acid bacteria and in muscle. I. HANS V. EULER AND RAGNAR NILSSON. *Z. physiol. Chem.* **155,** 186-94(1926).—The mechanism of lactic-acid production is apparently the same for lactic-acid bacteria (*Thermobacterium helveticum* and *Streptococcus lactis*) as for muscle. The cozymase may be liberated by boiling the bacterial suspension and its presence demonstrated by its activation of washed dried yeast. The enzyme systems of lactic-acid bacteria, of yeast and of animal tissue present striking similarities. Reductase and coreductase may be demonstrated in both fresh and dried bacteria by the methylene blue test, and both cozymase and coreductase may be extd. from the dried bacteria by washing with H_2O. A. W. DOX

Spectrographic investigations of amino acids, 2,5-diketopiperazines, peptones and proteins. EMIL ABDERHALDEN AND RICHARD HAAS. *Z. physiol. Chem.* **155,** 195-9 (1926).—Proteins, peptones and some 2,5-diketopiperazines show a strong absorption in the ultra-violet, while amino acids and polypeptides show only a slight absorption. Diketopiperazines absorb more strongly than the corresponding dipeptides. Tautomeric forms are also distinguishable, a striking difference being observed in the case of *dl*-norleucyl-*dl*-leucine anhydride where the absorption began at 2730 A. U. in the keto and at 3470 A. U. in the enol form. Enol and keto forms also show differences in refractive power, the enol giving the higher index of refraction. Solns. of the enol form also have a higher sp. gr. than tautomeric keto solns. of the same concn. Amino acids, *e. g.*, alanine, show a slightly stronger absorption in the ultra-violet when crystd. from H_2O than when pptd. from aq. soln. by EtOH. Phys. properties may thus aid in distinguishing between tautomers and in elucidating the nature of the amino acid linkages in proteins. A. W. DOX

Glucose and fructose retardation of invertase action. J. M. NELSON AND R. S. ANDERSON. *J. Biol. Chem.* **69,** 443-8(1926); cf. *C. A.* **19,** 835.—The rates of hydrolysis of 2, 5, 10 and 20% sucrose solns. contg. the same amts. of invertase were detd. at 0.13° and p_H 5. These rates were compared with those of similar solns. to which were added α- or β-glucose, and mutarotated or β-fructose, as retardants. The retardation decreases with increase in sucrose concn. Although the degree of retardation by the substances studied varied, the shapes of the velocity curves are similar except with α-glucose. ARTHUR GROLLMAN

The so-called oxygen content of methemoglobin. J. B. CONANT AND N. D. SCOTT. *J. Biol. Chem.* **69,** 575-87(1926); cf. *C. A.* **19,** 2061.—A study of the extent of oxidation of carbonylhemoglobin by various oxidizing agents and the effect of CO was made.

The view of Nicloux (*C. A.* **19,** 3302) that methemoglobin contains only half the O of oxyhemoglobin is shown to be erroneous. ARTHUR GROLLMAN

Colloidal properties of the surface of the living cell. II. Electric conductivity and capacity of blood to alternating currents of long duration and varying in frequency from 260 to 2,000,000 cycles per second. J. F. MCCLENDON. *J. Biol. Chem.* **69,** 733–54 (1926); cf. *C. A.* **20,** 2684.—An app. for the measurement of the elec. cond. of cells with high-frequency currents is described. The behavior of beef-blood cells, their conds. and capacities were detd. A single plasma membrane has a capacity of 9×10^6 micro-microfarads per sq. cm. and would have a thickness of 3×10^{-7} cm., a dielec. const. of 10 being assumed. The thickness of the elec. double layer is shown to vary inversely as the concn. of the electrolytes. ARTHUR GROLLMAN

Menformone, the hormone of the estrual cycle. ERNST LAQUEUR, P. C. HART AND S. E. DE JONGH. *Proc. Acad. Sci. Amsterdam* **29,** 591–7(1926). (In English).—See *C. A.* **20,** 2530. E. H.

Chemical iron analysis in organs. W. F. DONATH. *Mededeel. Dienst Volksgezondheid Nederland. Indië* **1926** (III), 184–239.—The Fe content of liver, spleen and kidneys from 260 European, native and Chinese autopsies was detd. by the methods of Neumann (*Z. physiol. Chem.* **37,** 115(1902); **43,** 32(1904)) and Neuberg (Der Harn I, p. 163). The tabulated results show too great variations to permit a brief summary. MARY JACOBSEN

Biochemistry and biology of iodine. MARTIN ENGLANDER. *Österr. Chem.-Ztg.* **29,** 93–9(1926).—A review. MARY JACOBSEN

The dominant thought in the work of Paul Ehrlich. ALBERTO ASCOLI. *Biochim. terap. sper.* **12,** 1–15(1926).—Biographical. MARY JACOBSEN

Agglutination of blood corpuscles by sucrose and other nonelectrolytes. GUIDO OSELLADORE. *Biochim. terap. sper.* **13,** 197–208(1926); cf. Hoeber and Memmesheimer, *C. A.* **17,** 2718; Radsma, *C. A.* **13,** 336.—Blood corpuscles washed with isotonic sucrose or NaCl soln. are agglutinized by a 5.15% sucrose soln. Lower concns. cause hypotonic hemolysis, higher ones have no effect. Agglutination is prevented or reversed by electrolytes. The mechanism of this and related phenomena reported by other authors is probably the following: Sucrose (and *glucose*) cause the flocculation of the globulins of the serum around the erythrocyte or on the erythrocyte surface itself. This results in either an increase of surface tension between cell and medium or a decrease of the elec. cell charge or both, which leads to agglutination. A no. of facts is adduced in support of this flocculation theory. Among others are the resistance of erythrocyte of young animals to sucrose agglutination as a result of the lower proportion of globulins in their serum and the demonstrated decrease of permeability, irritability and sensitiveness to poisons of animal and plant tissues in glucose and sucrose solns. M. J.

The decomposition of soy-bean protein. III. Decomposition with caustic soda. MINORU MASHINO. *J. Soc. Chem. Ind.* (Japan) **29,** 248–51(1926); cf. *C. A.* **20,** 3302.—Soy-bean protein obtained from 4 different sources was decompd. by treating with 19.65% NaOH at 100° for 0.5–12 hrs. and the amts. of ammoniacal and amino nitrogen liberated were detd. The amt. of NH_3 liberated increases during the first 4 hrs., then remains almost const. The av. ratios of NH_3 N to total N, when treated for 4–12 hrs., are 16.5, 18.6, 19.5 and 17%, resp. The rate of decompn. of the protein is nearly the same for the 4 samples. The ratios of NH_2 N to total N, when decomposed for 12 hrs., are 65.6, 68, 68.6 and 67.6%, resp. **IV. Supplement to the previous reports.** *Ibid* 252–4.—A supplementary and summarized discussion on the previous papers. Four kinds of soy-bean proteins were decomposed by treating with 19.98% (at 40° and 100°) and 38.5% HCl (at 100°), with 19.65% H_2SO_4 (at 100°), or with 19.65% NaOH (at 100°) for 0.5–12 hrs. and the rate of decompn. of the protein was measured by detg. the amt. of NH_3 and NH_2 N evolved. The amt. of NH_3 liberated by decompn. becomes const. after some hrs. The av. ratio of NH_3 N to total N, in the acid treatment, is 9.59% and 17.32% in the alkali treatment. The av. sum of NH_3 N and NH_2 N liberated by HCl treatment is 77.86% and other N 22.14%. The sum of NH_3 N produced by NaOH treatment and NH_2 N by HCl treatment is 86.51% and the other N 13.49%. It seems that the violet color of the biuret reaction for soy-bean protein is related to the NH_3 in the protein mol. When all NH_3 is evolved, no violet color is observed. The free carboxyl group in the protein mol. may be present combined with the amino group. The rate of decompn. of the soy-bean protein is not much varied whether it is previously treated with superheated steam or not. The oil-extd. soy-bean cake is, therefore, used for producing amino acids. K. KASHIMA

The specificity of luciferin and luciferase, together with a general survey of the reaction. E. N. HARVEY. *Am. J. Physiol.* **77,** 548–54(1926).—Of 42 different genera

of luminous animals, representing some 20 groups, only a few, *Pholas dactylus*, ostracods, fire-flies and *Odontosyllis* give the luciferin-luciferase reaction. *Cypridina* luciferin (or luciferase) will react with the luciferase (or luciferin) of 2 other genera of ostracods with luminescence, but with none of the other luminous animals, 35 genera having been tested. The reaction is, therefore, highly specific The failure of the luciferin-luciferase reaction in exts of many luminous species may be due to a relative deficiency of luciferase. Just enough luciferase is present to be used up by the luciferin. Exts. of these, therefore, always contain no luciferase after luminescence has gone to completion (H.'s method for prepg. luciferase). J. F. LYMAN

The production of sugar in the perfused liver from non-protein sources. J. H. BURN AND H. P. MARKS. *J Physiol.* **61,** 497-517(1926).—Livers free or nearly free from glycogen and diffusible substances produced sugar in amts such that a conversion of fat to reducing sugar was indicated. Insulin, adrenaline or pituitary ext had no obvious effect on the process. J. F. LYMAN

The effect of anoxemia upon heart and circulation. A. JARISCH AND H. WASTL. *J. Physiol* **61,** 583-94(1926) - The vasomotor center responded when the O_2 satn. in the blood was lowered to about 75%, usually rising but sometimes falling When the blood contained over 60% satn of O_2 the heart itself (vagi cut) was not affected. Below this critical limit acute dilatation and failure of the heart was imminent. J F L.

The equation expressing the excretion of a diuretic and its relation to diffusion processes. E. J. CONWAY AND F. KANE *J. Physiol* **61,** 595-607(1926).—A formula $\sqrt{1/t}\,(C_u - C_B) = K$, previously found to apply to glucose and with a modification to NaCl (*C A.* **19,** 3109), was found to apply also to urea when the concn. in the blood was raised by injection to 0 2% An equation of the same form applies to simple diffusion and was shown experimentally to apply to the diffusion of I from H_2O to a higher concn. in $CHCl_3$. Excretion in the kidney is thought by C. and K. to be a similar diffusion process A partition coeff may be created in the watery media of the body as a result of the interference with the hydration of solids in water. J. F. LYMAN

The sources of energy in ontogenesis. J NEEDHAM. Proc Physiol. Soc, *J. Physiol* **61,** xxxiii(1926).—In the embryo chick there is a period of intensive urea formation from the 5th to the 9th days of incubation Between the 7th and 11th days there is a period of intensive uric-acid production The point of max intensity of protein metabolism is reached at 8 5 days The oxidation of carbohydrate is assocd. with the first 5 days, and of fat with the last 10 days. The protein N lost during incubation is 7.5% of the total present at the beginning and protein makes 3% of the total material burned J. F. LYMAN

The polariscopic appearance of colorless "crystals" of hemoglobin. D. F. HARRIS. Proc. Physiol Soc, *J. Physiol* **61,** xxxiv(1926) — White "crystals" of hemoglobin appearing in old prepns. were uniformly dark under crossed nicols They are probably masses of powder either microcryst or truly amorphous, representing the protein basis of the hemoglobin crystal, which have retained the external form and angles of the tetrahedron. J. F. LYMAN

The reaction between globin and hematin. R. HILL AND H. F. HOLDEN. Proc Physiol Soc, *J Physiol.* **61,** xxii(1926) - Globin reacts with hematin to form methemoglobin, from which may be obtained oxyhemoglobin that is spectroscopically indistinguishable from the original oxyhemoglobin. J. F. LYMAN

The osmotic pressure of the proteins of human serum and plasma. E. B. VERNEY. *J. Physiol* **61,** 319-28(1926).— App. for detg. the osmotic pressure of blood proteins is described. Diln of blood plasma with Ringer's soln caused a relatively larger fall in the osmotic pressure than the concomitant fall in the protein concn. This may be due to the large mol. vol. of the protein particles, the plasma behaving analogously to a highly compressed gas, in which the colloidal mols occupy an effective vol. as large as 50% of the original J. F. LYMAN

Cellular activity and cellular structure as studied in the thyroid gland. W. CRAMER AND R. J. LUDFORD. *J. Physiol.* **61,** 398-408(1926).—The microscopic appearance of thyroid cells in activity and during rest differed widely as to (1) the Golgi app ; (2) the nucleus and (3) the mitochondria. In thyroid cells during activity the cytoplasmic lipoids accumulate around the mitochondria; during rest the lipoid particles scatter. This ebb and flow of lipoids from the cytoplasm to the mitochondrial surface and back must affect the lipoid concn. in cytoplasm and cell membranes and would account for alterations in cell permeability. J. F. LYMAN

The effect of age on the hemoglobin of the rat. C. S. WILLIAMSON AND H. N. ETS. *Am. J. Physiol.* **77,** 480-2(1926).—The hemoglobin content of rats blood steadily

falls during the first 50 days of life and then gradually rises until about the 150th day when a max. is reached. Thereafter the value again falls to a level which it maintains. The av. of 730 detns. gave 13.77 ± 0.24 g. of hemoglobin per 100 cc. of blood.
J. F. LYMAN

Bioluminescence and fluorescence in the living world. E. N. HARVEY. *Am. J. Physiol.* **77,** 555–61(1926).—Some luminous tissues show fluorescence and some do not when examd. in near ultra-violet light. The oxidation product of chemiluminescent substances is more likely to be fluorescent than is the chemiluminescent body itself.
J. F. LYMAN

The proteolytic enzymes of serum. I. H. J. FUCHS. *Biochem. Z.* **170,** 76–101 (1926).—Serum does not hydrolyze fibrin of the same species either *in vitro* or in the dialysis tube. On the contrary, serum does attack fibrins from other species. Where the reaction is carried out *in vitro* with no provision for the removal of the split products, the hydrolysis of the fibrin increases slowly and comes to a standstill when reaction equil. is reached; where, through dialysis against distd. water, the products of hydrolysis are removed, the rate of hydrolysis increases more rapidly but the process finally stops long before the substrate has been exhausted; lastly, where the dialysis is carried out not against H_2O but against a soln which has the same salt concn. as the serum, the hydrolysis is still more vigorous and proceeds to the complete disappearance of the substrate. Protein in contact with neutral salt solns. of about the same concn. as plasma gives off slowly dialyzable nitrogenous products, but the amts. are much smaller than in enzymic hydrolysis. Serum heated to 56° for 30 min. loses its proteolytic power.
S. MORGULIS

The behavior of neutral sodium caseinate in membrane hydrolysis. WILHELM STARLINGER. *Biochem. Z.* **170,** 1–17(1926).—Neutral casein solns. can be preserved under toluene at room temp for many months without undergoing any changes in cond. or autolytic decompn, as evidenced by the failure of the appearance of non-coagulable N. In dialysis expts through various membranes, even under rigorous exclusion of bacterial decompn, the neutral Na caseinate undergoes slight autolysis with the appearance of non-coagulable N, but the total conductance capacity is raised only to a very insignificant degree The alterations are as follows: more or less of the non-coagulable N compds pass out, depending upon the permeability of the membrane and the duration of dialysis, and the OH-ion concn. of the outer fluid is also increased but not in a significant manner as compared to the much greater rise in the Na-ion concn. The diffusion of Na^+ is only partially compensated by the passage of OH^-, for the rest the compensation depends upon diffusible N compds. or in their absence, upon HCO_3^- P-contg. ions play no part in the process.
S. MORGULIS

The enzymic splitting of sucrose from salts of sucrose-phosphoric acid. CARL NEUBERG AND MARTIN BEHRENS. *Biochem. Z.* **170,** 254–64(1926).—The analogy between raffinose and sucrose-H_3PO_4 is borne out by the fact that just as emulsin splits off galactose from raffinose so do phosphatases of animal origin (extd. from the kidney) split off H_3PO_4 from sucrose-phosphate, leaving the sucrose intact. A method is described for the sepn. and purification of sucrose which depends upon the extn of the sucrose with strong alc from the original mixt. The alc. ext. is condensed *in vacuo*, the residue being again extd. with MeOH. The dissolved sucrose is now pptd. with a satd. soln. of $Ba(OH)_2$ in abs MeOH, and the pure sucrose is obtained by decompg. the Ba salt with CO_2
S. MORGULIS

The influence of cations in solutions of varying concentration on the osmotic resistance of red blood cells. ALEXANDER SIMON. *Biochem. Z* **170,** 244–53(1926).—The chlorides of various cations were dissolved in physiol NaCl soln. To 2-cc. portions of these mixts. was added 0.35 cc. human blood and this was incubated 30 min. in the case of Na, K, Ca or Mg salts, or 12 hrs. in the case of salts of heavy metals. The corpuscles were then thrown down by centrifuging, the supernatant fluid being completely removed. By means of a micropipet a drop of the residue was added to each of 4 tubes contg. 1 cc of 0.50, 0.45, 0.40 and 0.35% NaCl. After 15 min. these were centrifuged and the degree of hemolysis was detd. by the color of the soln. This was matched with the color produced by placing 3 drops of blood in 3 cc. H_2O, representing 100% hemolysis,from which by proper diln. a series of tubes was prepd. corresponding to 90, 80, 70, 60, 50, 40, 30, 20 and 10% hemolysis. A general regularity in the influence of cations in different concns. is apparent from the exptl. results. With the exception of NH_4Cl and $HgCl_2$, the cations depending upon their concn produce either an increased or a diminished resistance. The heavy-metal salts increase the cell resistance in concns. of $^1/_{600}$–$^1/_{10,000}$ molar; the alkali and alk. earths, in $^1/_6$–$^1/_{48}$ mol. concns. The latter in their influence upon cellular resistance fall into a series Li′

< Na′ < K′ < Mg″ < Ca″. The changes in resistance are regarded as being due to alterations in the membrane colloids. S. MORGULIS

The influence of some quinine derivatives on the activity of dehydrogenases of skeletal muscles. ERIK ESSEN-MÖLLER. *Skand. Arch. Physiol.* **48**, 99–124(1926).—The effect of optochine, eucupine and vucine (3 homologs of hydrocupreine) on the dehydrogenases from frog and horse muscle has been studied by Thunberg's methylene-blue method, with both succinic and glycerophosphoric acids. Already at such small concn. of the poisons as 0.02–0.8 millimol. the enzyme activity is inhibited and the discoloration of the methylene blue noticeably retarded. At a concn. of 0.1–1 millimol. the reaction is 50% inhibited The H-ion concn. within the investigated range of p_H 6.3–8.6 produces an unmistakable influence on the effectiveness of the poison, its action diminishing with increasing alky. In equimol. concn. and independently of the p_H the action of the poisons is in this order: vucine > eucupine > optochine. Very small concns., 0 001–0 08 millimol , of the poison sometimes stimulate the enzymic dehydrogenation of muscle pulp greatly, but such an effect is never obtained with the enzymes isolated from the muscle. With isolated enzyme only inhibition was observed. The Arndt-Schulz "biological law," according to which all poisons have a stimulating effect in very small concns. which is changed to an inhibiting effect as the concn. increases, is criticized, and the observed phenomena are interpreted in terms of a physico-chemical alteration. S MORGULIS

Studies of parenteral resorption. IV. The influence of some adsorbents on intraperitoneal resorption of trypan blue. N. OKUNEV. *Biochem. Z.* **168**, 251–62 (1926); cf. *C. A.* **20**, 1859.—Animal charcoal, gelatin, gum arabic and casein slow up the intraperitoneal resorption of trypan blue, but to varying degrees The greatest effect is produced by charcoal, the smallest effect by gelatin and gum arabic. The greatest effect on the resorption of the dye is exerted when it is injected simultaneously with the various substances. When these different substances are injected separately but in large quantity they can still inhibit the resorption of the dye even if the 2 injections are 30 min apart. With animal charcoal the effect is ascribed to the resorption of the dye, which may be so extensive that no trypan blue will pass from the peritoneum into the blood. The slowing effect of gelatin, etc., on the resorption of trypan blue is probably due to a more complex process, but it is suggested that this may be a phenomenon similar to the inhibition of diffusion of trypan blue *in vitro*. The importance of the use of adsorbent materials in the treatment of peritonitis is also pointed out which can be used without any ill effect to the organism as a means of slowing or checking the absorption from the peritoneum of toxic products. S. MORGULIS

The synthetic action of pepsin. T. ODA. *J. Biochem.* (Japan) **6**, 77–89(1926).—Peptic digests of egg white, edestin and fibrin were used with equal success in these expts. This digest after special treatment gave but very slight turbidity on the addition of CCl_3COOH. Five cc. of this digest were incubated with 1 cc. of a 5% pepsin soln., the changes in the amt. of N unpptd. by CCl_3COOH being taken as a measure of the extent of synthesis. The synthesis is completed after 2 days of incubation, and is most rapid at p_H 4. The max. results depend entirely upon the p_H and is little affected by the nature of the acid used provided the optimum p_H 4 is secured. Various electrolytes apparently have no influence upon the process of synthesis, nor is it affected by lecithin or cholesterol. The free NH_2 N is not altered during the process. S. M.

The relation between bile acids, snake venom and cholesterol. I. SADATOMO YONEMURA AND MASAO FUJIHARA. *J. Biochem.* (Japan) **6**, 91–100(1926).—Cholic and desoxycholic acids have a strong hemolytic effect on rabbit red blood cells which is twice as great as their effect on beef red cells. They also act plasmolytically on leucocytes, the concn. for cholic acid being 1:800, and for desoxycholic acid 1:3200. Injected intravenously into rabbits cholic and desoxycholic acids like the poison of *Trigocephalus* reduce the blood cholesterol and the number of leucocytes. S. MORGULIS

A tetrapeptide from gliadin. R. NAKASHIMA. *J. Biochem.* (Japan) **6**, 55-60 (1926).—In a peptic digestion of gliadin it was noted that after the first day the soln. became turbid, and after 2–3 days a cryst. ppt. settled down to the bottom. This ppt. was washed 2–3 times with H_2O, then with alc. and dried over H_2SO_4. One g. was obtained from 16 g. gliadin. Under the microscope the crystals appear as colorless needles clumped together at their ends. In the desiccator the substance becomes amorphous. It m. 283–285°, is insol. in H_2O, alc., acetone, ethyl ether, $CHCl_3$ or glacial AcOH. It is also insol. in mineral acids but in *N* NaOH it yields a turbid soln., which on warming gives off NH_3. In this alk. soln. a pos. reaction is obtained with ninhydrin, biuret, HNO_3 and Millon's reagent. The crystals contain 4.3 mol. H_2O for 1 mol. tetrapeptide. Of the total N content of 14.58% 1/3, or 4.93% is in the form of NH_3 N

and the remaining $^2/_3$, or 9.94%, as NH_2 N. After hydrolysis with 25% HCl crystals of tyrosine and glutamic acid were obtained (in the ratio of about 1:2). From these findings it is suggested that the substance is a tetrapeptide consisting of 1 mol. tyrosine, 2 mols. glutamine and 1 mol. glutamic acid with 4 mols. of H_2O. The elementary compn. corresponds very closely to the percentages calcd. on the basis of the above assumption S. MORGULIS

The enzyme content of the blood in experimental sympathicotonus. S. SOROCHOWITSCH. *Biochem. Z.* **169,** 409–16(1926).—In a condition of exptl. sympathicotonus in rabbits, the enzymes of the blood (diastase, phenolase, fibrin ferment, fibrinogen and antitrypsin) remain unchanged. In pancreatectomized dogs, the lipase decreases. This tends to show that the greater part of the blood lipase comes from the pancreas. W. D. L.

A contribution to the theory of phagocytosis. E. PONDER. *J. Gen. Physiol.* **9,** 827–34(1926).—The surface forces, *i. e.*, interfacial tension, elec. forces, which govern phagocytosis, are discussed and additions to the theories of Fenn (*C. A.* **15,** 1906, 2454; **16,** 1274, 1785, 4218) and Tait (*Quart. J. Exptl. Physiol.* **12,** 1, 1918) are offered. C. H. R.

The reversal of physiological dominance in ameba by ultra-violet light. O. L. INMAN, W. T. BOVIE AND C. E. BARR. *J. Exptl. Zool.* **43,** 475–84(1926).—Ultraviolet light interfered with the normal course of physiol. change in ameba. Physiol. dominance of the advancing pseudopod was lost, resulting in a reversal of direction of locomotion. These results are consistent with the organization of protoplasm as described by Barr and Bovie (*J. Morphol.* **38,** No. 2, (1923)). C. H. R.

Electrical polarity of Obelia and frog skin and its reversible inhibition by cyanide, ether and chloroform. E. J. LUND. *J. Exptl. Zoöl.* **44,** 383–96(1926).—Elec. currents associated with polarity in the stem and colony of *Obelia longissima* can be reversibly inhibited by means of KCN, Et_2O and $CHCl_3$. Treatment of the ends of an *Obelia* stem with KCN in sea water (0.01 *M*) reverses the direction of the normal elec. polarity of the stem. This reversal does not involve a local reversal of p. d. across the ecto-endoderm. Upon removal of the KCN the normal polarity returns. Repeated treatment of the stem with KCN at concns. that reversibly decrease polarity does not affect capacity for growth and regeneration The normal elec. polarity of the *Obelia* stem is the result of unequal differences in p. d. across the ecto-endoderm layer of apical and basal ends of the stem. The apical growing part of this layer usually has a higher p. d., than other parts. KCN, Et_2O and $CHCl_3$ reversibly decrease the elec. polarity of frog skin. The polarity of *Obelia* stem and frog skin probably have a similar origin. C. H. R.

The absolute viscosity of protoplasm. L. V. HEILBRUNN. *J. Exptl. Zoöl.* **44,** 255–78(1926).—A centrifuge method for measuring the abs. viscosity of protoplasm is described It depends on Stoke's law. The viscosity of the granule-free protoplasm of the *Arbacia* egg is approx. 0.02; that of the clam *Cumingia* is <0.04. The viscosity of the entire protoplasm of *Arbacia* and *Cumingia* eggs is approx. 2–3 times that of the granule-free protoplasm. C. H. R.

Determination of the protoplasmic viscosity of Paramecium by the centrifuge method. D. FETTER. *J. Exptl. Zool.* **44,** 279–83(1926).—The abs. viscosity of the internal protoplasm as detd. by the centrifuge method (cf. preceding abstract) is 8027–8726 times that of water. C. H. R.

Action on fibroblasts of the protein fraction of embryonic tissue extract. LILLIAN E. BAKER AND ALEXIS CARREL. *J. Exptl. Med.* **44,** 387–95(1926).—The protein fraction of embryo tissue juice contains the activating fraction. Tissues continue to grow for a long time in the protein of the ext. pptd. by CO_2 and at a rate approx. equal to that in the original ext. dild. to the same N concn. The non-protein N gives slight stimulation to growth. Purification of the protein by repeated pptn. destroys its growth-promoting properties but the reason for this has not been ascertained. Prepns. of purified proteins from embryonic tissue and egg white have shown no marked nutritive or stimulating action. A no. of other pure substances have been tried without effect. C. J. WEST

Effect of the amino acids and dialyzable constituents of embryonic tissue juice on the growth of fibroblasts. L. E. BAKER AND A. CARREL. *J. Exptl. Med.* **44,** 397–407(1926).—The ultrafilterable constituents of embryonic tissue ext. are unable to support cell life *in vitro.* They stimulate cell migration and possibly multiplication, without increasing the mass of the tissue. Embryonic tissue ext., freed from NH_2 acids by dialysis, still retains a considerable part of its growth-promoting properties. The area of growth of tissues in embryonic tissue exts. free from NH_2 acids is appreciably

less than that with the whole ext., probably because of the denaturation of part of the protein, or perhaps the inactivation or loss of an enzyme. The addn. of either the ultrafilterable components or an artificial mixt. of NH_2 acids to this dialyzed ext. increases the area of cell migration but does not restore all the activity lost on dialysis.
C. J. West

Reversible oxidation-reduction systems of cysteine-cystine and reduced and oxidized glutathione (Kendall, Nord) **10.**

Mathews, Albert P. **Physiological Chemistry.** 4th ed. New York: William Wood & Co. 1233 pp. Reviewed in *Am. J. Med. Sci.* **172,** 273(1926).

Oppenheimer, Carl: **Fermente und ihre Wirkungen. Vols. XI and XII.** 5th ed., revised. Leipzig Verlag Georg Thieme.

B—METHODS AND APPARATUS

STANLEY R. BENEDICT

The use of the bicolorimeter for the estimation of the hydrogen-ion concentration of urine. V. C. Myers and L. E. Booher. *Proc. Soc. Exptl. Biol. Med.* **22,** 511-2 (1925).—Acid and alk. wedges are prepd. for each of the following indicators, giving a range for phenol red of p_H 6.6 to 8.6, for bromocresol purple of p_H 5.2 to 7.0 and for bromocresol green (or methyl red) p_H 4.6 to 5.4. The prepn. and calibration of the wedges are described. The method has a color comparison error of $\pm$ p_H 0.02 to 0.04.
C. V. B.

The mercury-combining power of deproteinized blood. P. S. Hench and M. Aldrich. *Proc. Soc. Exptl. Biol. Med.* **22,** 556-8(1925).—Protein is removed by the addn. of an equal vol. of 10% CCl_3CO_2H and by filtering or centrifuging. Five cc. of the filtrate is titrated with 5% $HgCl_2$ soln. until a faint tinge of brown appears within 3 sec. when a test drop is added to a drop of satd. Na_2CO_3 soln. on a spot plate. The titration value is multiplied by 40 to obtain the Hg-combining power of 100 cc. of deproteinized blood. The normal value is 70-100 cc. When the blood urea was 480 mg. the Hg-combining power was 500 cc. With this test, in 15 min. the presence or absence of nitrogen retention in the body and the degree of such retention can be detd.
C. V. B.

Apparatus for the rapid evaporation of unstable solutions (sera, etc.). W. Gade and W. Straub. *Biochem. Z.* **165,** 247-9(1925).—The app., which can be evacuated, consists of a vessel contg. the soln., heated in a water bath, connected with a second vessel contg. H_2SO_4, cooled in a cooling bath.
B. C. A.

The correction of colloidal gold solutions as applied to the Lange reaction. N. Novick. *Arch. Neurol. Psychiatry* **15,** 471-4(1926).—The primary cause of unsuitable solns. is the reaction of the final product. Alizarin is not entirely satisfactory as indicator. The amt. of NaOH or HCl necessary is detd. by addn. to a series of tubes contg. different amts. of 0.05 *N* NaOH or HCl with 5 cc. colloidal Au soln. of 1.7 cc. 1% NaCl. The tube showing complete pptn. and contg. the least amt. of acid or alkali is taken as correct, and the amt. of acid or alkali required for the bulk soln. calcd. from it.
A. T. Cameron

Simultaneous micromeasurement of urea and ammonia (procedure with the synthetic zeolite "permutite"). Mme. B. Pohorecka-Lelesz. *Bull. soc. chim. biol.* **8,** 178-83(1926); cf. *C. A.* **19,** 1287; **20,** 1639, 1640.—The conditions are detailed under which NH_3 can be accurately absorbed by permutite, regenerated by aq. NaOH and measured by HBr iodometry. The accuracy is within 1%. In biological liquids contg. both urea and NH_3 the latter can be removed by permutite and estd. accurately as above when present in amts. less than 0.1 mg. Urea in the filtrate is decompd. by urease and the NH_3 estd. by aeration, or as xanthylurea by the microbalance.
A. T. Cameron

Integral fixation of proteins by hydroxides of tervalent metals. I. Employment of potassium aluminum alum. II. Employment of chromium and iron alums. H. Wunschendorff. *Bull. soc. chim. biol.* **8,** 184-91, 192-8(1926); cf. *C. A.* **20,** 1640.—Addn. to a soln. of proteins, such as horse serum, of tervalent ions as Al, Cr or Fe (as alums) and then of a convenient amt. of alkali, results in formation of the hydroxides, which form complexes with the proteins that are carried down with the ppt. If sufficient alum is added the proteins are completely removed from soln. even before neutrality is attained, but this removal is never complete, whatever the amt. of NaOH added, unless a certain definite min. of alum is used. By using 5% alum solns. in order to ppt. completely the proteins from 2 cc. of serum at least 21 cc. Al alum, 14 cc.

Cr, and 4 cc. Fe alum are necessary. This relationship is in the inverse order of the at. wts. A. T. CAMERON

The commercial production of hormones. F. H. CARR. *J. Soc Chem. Ind.* **45**, 241-4T(1926).—In order to prevent autolytic changes, the crude glands must be removed from the animal and frozen at once. The frozen gland is then ground at 0°. In recovering insulin, the ground material is at once mixed with alc at p_H 3.5, filtered, and the ext evapd. in tubular evaporators. Assocd proteins are removed from the residue by fractional pptn. with acid up to p_H 5 The pure insulin is finally pptd. as the picrate. In the manuf. of thyroxin, Harrington's method of hydrolysis with $Ba(OH)_2$ has increased the yield 25 times T. S. CARSWELL

A new calorimeter for use with young farm animals. T. DEIGHTON. *J. Agr Sci.* **16**, 376-82(1926).—A description is given of the construction and testing of a small calorimeter adapted to young animals. The necessary exptl errors are low in proportion to the total heat evolution to be measured. P R. DAWSON

Examination of gastric juice for lactic acid and the pharmaceutical identification of the latter. G CAPPELLI. *Ann. chim. applicata* **16**, 53 68(1926) —There has previously been no method whereby lactic acid can be detd with certainty, when present in low concn. in mixts. such as stomach contents For this reason systematic expts were carried out to det. the best reagent and conditions for its identification on decompn. to AcH The color reactions with 22 phenolic compds. showed a wide variation in their suitability as reagents for a characteristic test, and the procedure finally adopted includes not only the AcH test, but 2 other tests as means of certain identification. It is essential to sep the lactic acid from the stomach contents. Filter the latter, conc on the water bath to a sirup, add excess $BaCO_3$ or Na_2CO_3, acidify with H_3PO_4, boil off CO_2, cool, ext repeatedly with Et_2O (alc -free), leaving in contact 10 min each time, sep the Et_2O portion, filter, add 10 cc of H_2O, expel all Et_2O and filter, the filtrate (*A*) serving for all tests, in which case 10-15 cc. is sufficient. *Zn lactate test* —Add to 2 cc of *A* a slight excess of ZnO or $ZnCO_3$, boil, filter and evap. the filtrate *in vacuo* in a polished porcelain dish, whereupon Zn lactate crystallizes in characteristic form. When in large enough quantity it can be identified further by heating 8 hrs. in a closed tube with 1 part concd H_2SO_4 and 3 parts H_2O, neutralizing, distg. and testing the distillate for AcH as described later *CHI_3 test* - -Treat 2 cc of *A* with a few drops of I in aq KI, add a little 10% aq NaOH, in which case the pptn. of CHI_3 (which can be identified by the carbylamine test with $PhNH_2$ or $MeNH_2$) indicates lactic acid *Color reaction with phenolic compds* —Heat 2 min at 100° 3 sep mixts of 5 cc. of concd H_2SO_4 and 10 drops of *A*, cool to 15° and add to the sep. mixts. 3 drops of 1% alc. solns. of *p*-cresol, pyrocatechol and guaiacol. An orange-red color with *p*-cresol and a fuchsin-red with the last 2 indicates lactic acid. *CO test.*—Heat the remaining *A* at 100° with concd H_2SO_4 and either burn the gas evolved or lead it into $NaOH-NH_3-AgNO_3$, which serves to identify CO from the reaction: $MeCH(OH)CO_2H \longrightarrow AcH + CO + H_2O$. Many expts. indicate that all 4 tests should be positive to render certain the presence of lactic acid and conversely that positive tests in the 4 cases make certain its presence. *p*-Cresol, pyrocatechol and guaiacol were chosen for the AcH test after tests under various conditions with 22 phenols. The use of *p*-cresol has never before been suggested Some phenols, including β-naphthol (Barbet-Jandrier), were found to be useless, for the color was the same whether lactic acid was present or absent. Some of the phenols showed an immediate color which changed to another color after 2 min at 100°. The following data give the immediate color, and the limit of sensitivity based on the concn. of lactic acid: *p*-cresol, fuchsin-red, 1:100,000; pyrogallol, orange-red, 1:100,000; *m*-cresol, lemon-yellow, 1.100,000; thymol, greenish yellow, 1:100,000; resorcinol, greenish yellow, 1:100,000; guaiacol, intense orange, 1·10,000; pyrocatechol, intense orange yellowish fuchsin, 1:10,000; orcinol, rose-yellow, 1:10,000; phenol, orange-yellow, 1:10,000; *o*-cresol, lemon-yellow, 1.10,000; phloroglucinol, golden yellow, 1:10,000; hydroquinol, orange-yellow, 1:1000. C. C. DAVIS

The production of hydrocyanic and thiocyanic acids in the animal organism as a result of cadaverous putrefaction, considered from the chemico-toxicologic point of view. I and II. G. SENSI AND M. REVELLO. *Ann. chim. applicata* **16**, 268-80(1926).—The proposal of Chelle (*Compt. rend.* **159**, 726, 852, 973) to judge HCN poisoning by the presence of HSCN in the viscera is fallacious as a qual. test, since HSCN occurs normally in animal tissues and furthermore is formed during putrefaction (cf. S. and R., *C. A.* **20**, 3172). As a quant. test, however, it appeared of potential value, and expts. were carried out to det. its possibilities. Not all the HCN administered could be recovered even immediately after death, because part is instantly absorbed and transformed to other compds. by other organs, part is immediately decompd. and only

a small part of the remainder is converted to HSCN. Since the HSCN is formed in such small proportion, since it is also formed in putrefaction and since the relative extent to which these reactions occur varies among different individuals, it is difficult to distinguish between the 2 sources of HSCN in a quant. manner. If poisoning is caused by a large excess of HCN, the quantity of HSCN subsequently detected may be abnormally high, but if death occurs by the min. lethal quantity (*e. g.*, by gaseous poisoning) of HCN, the quantities of HCN and HSCN found in the viscera are not different enough from the normal under otherwise the same conditions to make certain poisoning by HCN. It was even found that in poisoning by gaseous HCN, neither HCN nor HSCN could be detected immediately after death and the HSCN subsequently appearing was normal. C. C. DAVIS

The determination of hemoglobin by means of the gasometric method of Van Slyke. ENRICO GREPPI. *Boll. soc. med. chir. Pavia* **36**, 465–75(1924); *Chem. Zentr.* **1925**, II, 1199.—The hemoglobin content of the blood can be detd. most accurately gasometrically by the max. satn. of the combined O (1 cc. of O = 0.746 g. of hemoglobin according to the method of Van Slyke). C. C. DAVIS

The utility of the Buerker colorimeter, with special reference to the determination of hemoglobin. FERDINAND LEBERMANN. *Munch. med Wochschr.* **72**, 982–5; *Chem. Zentr.* **1925**, II, 1199.—With the Buerker colorimeter (E. Leitz, Wetzler), 0.01 mg. of salicylic acid, 0.03 mg of KCN, 0.02 mg. of quinine, 0 003 mg. of Cu, 0.02 mg. of $K_2Cr_2O_7$ and 0 4 mg. of $CuSO_4$ can be detd. accurately. The instrument is especially suitable for very small quantities which cannot be distinguished by the Dubosq colorimeter or by a series of tubes. It is more accurate than the Sahli method for the detn. of hemoglobin C. C. DAVIS

The presence of phenols in normal blood, their detection and determination by the Millon reaction and remarkable blood phenol values in diseases, particularly in pernicious anemia. ERWIN BECHER, STILLFRIED LITZNER AND WILLY TÄGLICH. *Münch. med. Wochschr.* **72**, 1676 7(1925); *Chem. Zentr.* **1926**, I. 427.—A preliminary note. With a suitable technic and by the use of large quantities of blood, phenol can be detected and detd. by the Millon reaction in all normal blood and in that of invalids. Though it occurs in normal blood only in the combined state, in pernicious anemia there is not only an increase in its amt, but free phenol can be detected. C. C. D.

The preparation of oxyhemoglobin from human blood and its determination in absolute quantities. W. AUTENRIETH AND KARL DORNER. *Munch. med. Wochschr.* **72,** 2043 5(1925); *Chem. Zentr.* **1926**, I, 1466.—Faulty calibration of the hemometer is avoided by calibrating with pure oxyhemoglobin prepd. from human blood. The blood-coloring substance is then expressed as an abs. value, *i. e.*, as g. of hemoglobin per 100 cc. of blood. Details of the prepn. of oxyhemoglobin and its calibration are given. C. C. DAVIS

Simplification of the Pavy method for the determination of sugar in urine. S. ZISA. *Rif. med* **40**, 937–9(1924); *Chem. Zentr.* **1925**, II, 1540.—The solns. are (1) $CuSO_4$ (cryst) 4.158 g., Seignette salt 20.4 g., KOH 20.4 g., NH_3 (d. 0.88) 300 cc. made up to 1000 cc. with water and (2) Fehling soln. Ten cc. of soln. (1) corresponds to 5 mg. of glucose. Mix 5 cc. of (1) and (2), dil. to 20–30 cc. and heat, add simultaneously from burets and urine and twice its vol. of NH_4OH and boil rapidly until decolorized. Continuous addn. of NH_4OH is more convenient than any method which prevents the evapn. of the NH_3. C. C. DAVIS

Blood-sugar determination. P. J. KRUYSSE. *Pharm. Weekblad* **63**, 575–6(1926).—The Lehmann-de Haën method for glucose may be adapted to blood-sugar detn. as follows: Fold a strip of filter paper 3 × 6 cm. at $^2/_3$ its length and weigh, and to the surface of the remaining $^2/_3$ add 100 mg. of blood. Immerse the folded paper in a test tube contg. 2.5 cc. H_2O and shake gently. Add 10 cc. MeAc, stopper and shake. Filter through a 3-cm. paper into a 100-cc. wide-mouth flask and rinse twice with 5 cc. MeAc. Evap. to 2 5 cc., add 2 cc. $CuSO_4$ soln. (1.25%) and 2 drops of Fehling alkali. Boil 2 min. on an asbestos gauze over a small flame. Immerse the flask in cold H_2O, add 0.2 g. KI and 2 cc. of 0.1% starch soln. Add dropwise dil. H_2SO_4 until a blue color appears and titrate with 0.25% $Na_2S_2O_3$. Subtract the titer from 1.0 cc. and divide the difference by 2.9; the result represents mg. glucose in 100 cc. of blood. If more than 0.343 mg. glucose is expected, use more $CuSO_4$. A. W. DOX

Microchemical detection of cholesterol in tissue sections. A. SCHULTZ. *Centr. allgem. Path.* **35**, 314–7(1924). H. G.

A method for the determination of nitrates in fresh plant materials. A. SHMUK. *Nauk. Agron. Zhur.* **1**, 562(1924); *Expt. Sta. Record* **54**, 111.—A colorimetric method for the detn. of nitrates in fresh plant materials is described. This consists essentially

in warming the finely divided material in aq. suspension in a water bath for 30 min., decolorizing the soln. with alum and NH_3, evapg. to dryness, adding sulfophenol, and comparing the color with suitable standards in a color comparator. H. G.

Urine analysis. CARL OTTO. *Pharm. Ztg.* **71**, 591-2(1926).—A discussion of certain unusual reduction properties of urines when treated with Fehling's or Nylander's reagent. It was observed, *e. g.*, that uric acid, urates, oxalates, phosphates, biphosphates and NaCl, also NaCl in the presence of urates and uric acid, reduce alone neither Fehling's nor Nylander's reagent. Uric acid and urates in the presence of oxalates and biphosphates, however, effect strong reduction in Fehling's soln. (pptn. of red Cu_2O), while Nylander's reagent (except for a slight turbidity due to phosphates) is without action. Furthermore, glucose yields with Fehling's soln. in the presence of biphosphates or oxalates, $Cu_2(OH)_2$. A pure glucose soln. ppts. red Cu_2O. The smaller the glucose content and the greater the amt. of designated salts, the yellower will be the pptd. $Cu_2(OH)_2$, the color of which is orange-red with high glucose and low salt content. In these tests 2 parts of reagent were applied to 1 part of sample, which consisted of salt solns. (d. 1.035) corresponding to the density of the urine. With low glucose content, (under 0.05%), a correspondingly dil. Fehling's soln. induces a beautiful yellow opalescence. On boiling a urine sample with Fehling's soln., the nature of the color change, the form of ppt. and color tone of the unreduced portion of reagent permit certain conclusions, which must be reaffirmed by means of identity tests. Glucose urine develops on boiling with Fehling's soln. a yellow to orange-red ppt. quite characteristic for glucose. The reduction appears in the form of streaks extending upward from the walls of the test tube until the liquid in suitable mixt. becomes uniformly yellow. With strongly colored urines a prior decolorization with Pb acetate is advisable; with low glucose content moderate use of the reagent is recommended. The slowly forming ppt. is fine, remaining in suspension in samples with low glucose content. If the urine contains lactose, Fehling's soln. produces a coarsely granular red-brown ppt. which seps. more or less rapidly from the supernatant blue liquid. With pentose the ppt. is brown-red and lumpy. The unreduced portion of reagent is a dirty grayish green. The phloroglucinol-HCl test will corroborate this result. If urates in the presence of biphosphates and oxalates are the cause of reduction, the ppt. is reddish brown and finely granular, the supernatant liquid remaining clear and blue to azure-blue, according to the degree of reduction. W. O. E.

Bacteriological determinations of various sugars in urine. B. KLEIN AND P. SOLITERMAN. *Deut. med. Wochschr.* **52**, 959-60(1926).—The difference in the rate at which various sugars are fermented by *B. coli* is utilized in order to distinguish them. The urine is boiled for 1 min. and cooled. Two to three drops of litmus soln. is added and the soln. is neutralized with 1% NaOH to a blue color. Several loopfuls of *B. coli* are added and the soln. is incubated at 37°. Acidity develops in $^1/_2$ to 1 hr. if glucose is present; in 1 to 1.5 hrs. in the presence of levulose; in 1.5 to 2 hrs. in the presence of maltose and in 3 hrs. or more in the case of arabinose. ARTHUR GROLLMAN

A new contrast material for the röntgenological exhibition of the gall bladder. B. O. PRIBAM. *Deut. med. Wochschr.* **52**, 1291-4(1926).—Diiodoatophan, 2-*p*-iodophenyl-6-iodo-4-quinolinecarboxylic acid, $C_{16}H_9O_2NI_2$, serves admirably for the röntgenological display of the gall bladder. It is a light yellow powder, m. 280°; it is difficultly sol. in H_2O and alc.; tasteless and non-toxic. ARTHUR GROLLMAN

The female sexual hormone. IX. The quantitative biological estimation of the sexual hormone, its errors and their avoidance. S. LOEWE AND F. LANGE. *Deut. med Wochschr.* **52**, 1286-9(1926); cf. *C. A.* **20**, 2193.—A discussion of the numerous errors inherent in the biol. method for estg. the potency of ovarian hormones. A. G.

The estimation of calcium, magnesium, phosphate and carbonate in bone. BENJAMIN KRAMER AND JOHN HOWLAND. *J. Biol. Chem.* **68**, 711-9(1926).—Methods are described for the detn. of Ca, Mg, inorg. P and carbonate in 0.5 to 1 g. of bone. The bones are prepd. for analysis by extg. with alc. and Et_2O, drying at 100° and grinding to a fine powder. Carbonate is detd. as CO_2 by the method of Van Slyke (*C. A.* **11**, 2208). Ca is pptd. as the oxalate with bromocresol purple as the indicator, and detd. in the usual manner. Mg is detd. in the filtrate, after removing Ca, by the method of Briggs (*C. A.* **16**, 2701). Inorg. P may be detd. by a modification of the methods of Fiske or Briggs (*C. A.* **16**, 3493). ARTHUR GROLLMAN

A comparison of the Folin-Wu and the new Benedict method for sugar in blood and cerebrospinal fluid. J. D. LYTTLE AND J. E. HEARN. *J. Biol. Chem.* **68**, 751-7 (1926).—Simultaneous blood and cerebrospinal fluid sugar detns. were made on 26 patients by the Folin-Wu and new Benedict methods. The 2 methods agree in 14% of the blood analyses and about 50% of the cerebrospinal analyses. The Folin-Wu

method gives av. results which are 12.4 mg. too high for blood and 3.1 mg. too high for cerebrospinal fluid. Neither the non-protein N of the blood, nor the protein or non-protein N content of the cerebrospinal fluid bear any relation to the agreement shown by the methods ARTHUR GROLLMAN

The estimation of sugar in blood and normal urine. S. R. BENEDICT. *J. Biol. Chem.* **68,** 759–67(1926).—The method of *C. A.* **19,** 2352 was modified by substituting Na_2SO_3 for the $NaHSO_3$ previously recommended. The objections of Folin (*C. A* **20,** 2340) are criticized The final method proposed for the detn. of sugar in blood or urine follows Introduce 2 cc of 1:10 tungstic acid filtrate, and 2 cc. of the Cu reagent into a Folin-Wu sugar tube Place in boiling H_2O for 5 min., cool and add 2 cc. of the complex tungstic acid color reagent After 1 to 2 min. dil to 25 cc. with H_2O, mix, and compare with the standard, colorimetrically. The alk. Cu soln. is prepd as follows. Dissolve 6 5 g $CuSO_4$ in 100 cc H_2O Add 200 g. Na citrate and 60 g. anhydrous Na_2CO_3 dissolved in about 800 cc H_2O Add 9 g. NH_4Cl and dil. to a l Not more than a month before using add 2 5 to 3 g. of Na_2SO_3 to each 100 cc. of soln The complex tungstic acid color reagent is prepd as follows: Dissolve 100 g. of Na_2WO_4 in 600 cc H_2O in a l. flask Add 50 g. As_2O_5, 25 cc 85% H_3PO_4 and 20 cc. concd HCl Boil for 20 min ; cool; add 60 cc com formalin, 45 cc concd HCl, and 40 g NaCl; and dil. to a l ARTHUR GROLLMAN

A respiration apparatus for small animals. G L FOSTER AND E. S. SUNDSTROEM. *J Biol. Chem* **69,** 565 8(1926).—An app of the closed circuit type suitable for the study of the metabolism of small animals is described The animal is placed on a wire cloth in a tubulated desiccator over H_2SO_4 to prevent excessive humidity. A tube leads from the desiccator to a large bottle which serves as an O reservoir. The O consumed is measured and the CO_2 formed collected in $Ba(OH)_2$ absorbers which are constantly rocked. ARTHUR GROLLMAN

The falling drop method for determining specific gravity. H G. BARBOUR AND WM. F. HAMILTON. *J Biol Chem.* **69,** 625 40(1926) —A 10 cu. mm drop of fluid is timed as it falls over a distance of 30 cm through a mixt of xylene and bromobenzene, in a tube of exactly 7 50 mm. bore Its fall is compared with that of a standard K_2SO_4 soln of known d Alignment charts correcting for room temp. are given which permit an accuracy of 0.0001. ARTHUR GROLLMAN

The estimation of fructose, sucrose and inulin. W. R CAMPBELL AND M. I. HANNA. *J. Biol. Chem* **69,** 703-11(1926) --Volumetric methods for the estn. of fructose, sucrose and inulin in pure soln ; in the presence of glucose, lactose and maltose, and in blood filtrates are described They consist in direct reduction of Mo in H_3PO_4 soln , and reoxidation with $KMnO_4$ ARTHUR GROLLMAN

A quantitative micromethod for the estimation of blood sugar in eight minutes. BRUNO MENDEL AND MILLY BAUCH *Klin Wochschr.* **5,** 1329 30(1926) --Mix 1 cc. whole blood with 4 cc of H_2O and 1 cc of a 10% soln of metaphosphoric acid. Filter and add 0 5 cc. of a satd soln. of Ag_2SO_4 to 1 cc. of the filtrate. This removes chlorides which interfere with the reaction Centrifuge. Mix 0 5 cc. of the clear supernatant liquid with 3 cc of 95% H_2SO_4 Mix thoroughly and heat for 4 min. in boiling water. The color, so developed, is directly proportional to the concn of glucose for concns below 300 mg % This is not a reduction procedure and it is, therefore, not subject to any of the usual objections MILTON HANKE

Demonstration of peroxidase in serum. ST. KWASNIEWSKI AND N. HENNING. *Klin. Wochschr* **5,** 1472–3(1926).—A yellow to brown color develops in serum that has been treated with an equal vol. of peroxidase reagent (a benzidine soln.). The peroxidase may be derived from disintegrated leucocytes. MILTON HANKE

The practical value of the interferometric method in the Abderhalden reaction. E KAUFMANN *Klin. Wochschr.* **5,** 1557–61(1926).—The interferometric method is worthless for demonstrating sp. digestive processes The optical density of a soln. is neither quantitatively nor qualitatively dependent upon protein digestion. MILTON HANKE

Preparation of cholera poison. MARTIN HAHN AND JULIUS HIRSCH *Klin. Wochschr.* **5,** 1569(1926).—The cholera vibrio will multiply to its max. extent (2–4 billion bacteria per cc.) in 6–10 hrs. if the glucose supply of the medium is replenished from time to time and a p_H of 8 0 is maintained. The supernatant liquid (1 0 to 0.25 cc.), freed from bacteria by centrifuging, and sterilized with $CHCl_3$ or $C_6H_5CH_3$, will kill guinea pigs in 12–18 hrs The toxin is destroyed by heating to 70° for 0.5 hr. and is absorbed to a large extent by a Berkefeld filter. Guinea pigs that have been treated with a sub-lethal dose will, after a 7-day incubation period, tolerate 2 lethal doses. M H.

A modification of the deflection balance for use in biochemical laboratories. J. W.

TREVAN. *Biochem. J.* **20,** 419-22(1926).—The action of the balance depends upon the bending of a steel wire. By using a series of wires of different thicknesses on the same instrument, any range of weights from 1 mg. to 1 g can be weighed with an accuracy of ±1 in 10,000. BENJAMIN HARROW

Estimation of calcium in blood serum. J. W. TREVAN AND H. W. BAINBRIDGE. *Biochem. J.* **20,** 423-6(1926).—The method is similar to that used by Hamilton (*C. A.* **19,** 3534), in which the Ca is pptd as oxalate and then converted into carbonate by heat, the carbonate being titrated with acid. BENJAMIN HARROW

Determination of chlorine in blood and tissues by microtitration. P. B. REHBERG. *Biochem. J.* **20,** 483 5(1926).—By means of a microburet, 0.1 cc. of 0.15 *N* $AgNO_3$ is measured into the bottom of a test tube, 0 5 cc of concd HNO_3 is added, and into this 0.1 cc. of whole blood or plasma is measured. One-half cc H_2O_2 (30%) is added and the tube is closed by a test tube, shaken and heated on a water bath until the mixt. is of a clear yellow color (1 to 3 hrs, usually) For titration, 0 1 cc. concd ferric alum and 1 cc. ether are added. 0.1 *N* thiocyanate is added from a microburet, the soln. being stirred by means of a current of air bubbles coming from a fine tube reaching down to the bottom. Amt. of Cl per 100 cc fluid = $(150 \div a) \times 3.55$ mg, where a is the reading of the microburet in cu. mm. after the titration B. H.

New method for the determination of bilirubin in blood and the duodenal juices. E. ENRIQUES AND R SIVO *Rend d adunanze dell' accad. med.-fis fiorentina; Sperimentale* **80,** 148-58(1926).—Difficulties and sources of error in the van den Bergh method are pointed out. The new method depends on the color produced by the "diazo reagent" in the presence of caffeine-Na benzoate (I) or salicylate The bilirubin (II) cone of the Autenrieth-Hellige colorimeter is standardized against solns. contg. 0.8, 1 2 and 1 6 mg % (II) as follows: 0 5 cc. diln of II, 0 5 cc. 20% aq soln of I, and 0 2 cc. diazo reagent. The mixts. should be made in the dark and all 3 readings taken within 10 min, as lower values are obtained as the II alters Actual detns. are made with the serum or duodenal juice dild down within the scale if necessary, the same vols being used As little as 0 25 cc serum may be used, but the standardization must then also be carried out with half amts. Results on pure II are within 2-5% of those by the alc method, while on serum the new method gives values about 35% higher, since the ppt in the alc. method always carries down **II.** By the indirect procedure the results are about 15% higher than by the indirect alc. method. In the case of abnormally colored sera, the proper diln. of this may be interposed on the cone side, or a greenish yellow prism used. Good results are claimed in cases in which the alc. method gives undeterminable amts. or is negative, notably in tuberculosis and cachexia. With duodenal juices the new method gives values closer to those by the alc. method than are obtained with serum. M. HEIDELBERGER

Method for the extraction of total ether-soluble material from feces. R. G. FREEMAN, JR. AND E G. MILLER, JR. *Arch. Pediatrics* **43,** 421 2(1926).—*Total lipins* are detd. by thorough trituration of a definite mass (1 to 5 g.) of thoroughly mixed feces with 1 to 3 cc concd HCl, followed by trituration with anhydrous Na_2SO_4, 35 to 40 g. of the latter being used for each g. of feces. The dry mass is extd with pure Et_2O at room temp; the ether ext. is filtered through a hardened filter; and extn. is repeated with new portions of Et_2O until the lipins have been completely removed. The solvent is evapd, and the residue dried at a temp. of 98° to 100° then weighed. Its *free fatty acids* can be detd. by soln. in benzene and titration with 0.1 *N* EtONa. Fatty acids present as *soaps* are detd by difference; after repetition of the procedure the addition of HCl is omitted The wt. of the residue thus obtained is subtracted from the wt. of the residue previously obtained. This method is suitable for clinical purposes. JOSEPH S. HEPBURN

Ultra-violet radiation and metabolism, with a new method for estimating metabolism. J. A. CAMPBELL *Proc. Roy. Soc.* (London) **99B,** 451-61(1926).—A definite vol. of air (approx. 20 l.) is placed in a Douglas bag and is pumped by means of a suitable pump through the animal chamber back to the bag. The circuit is closed; proper mixing of the air in the bag is insured by placing the inlet at the top of the bag, and running the outlet (a long rubber tube) almost to the bottom of the bag. The temp of the animal chamber is kept const. by immersion in a bath of water. The vol. of the gaseous contents of the bag is detd. at the beginning and the end of each hourly period of circulation; their CO_2 content and O_2 content are detd. at the same time. When mice lie together in groups, apparently a decrease occurs in their output of CO_2 as a result of reduced surface area. The metabolism of healthy men, mice and rats is not influenced by exposure to the total rays (223 to 770 A.U.) from the Hg-vapor

lamp, or to these rays after filtration through uviol glass (290 to 436 A.U.) or to the visible rays from either source (400 to 770 A.U. and 400 to 436 A.U., resp.). J. S. H.

A chemical test for alcoholic intoxication. H. W. SOUTHGATE. *Medico-Legal Soc.*, Jan., **1926**; *Lancet* **210**, 207-9(1926); *Analyst* **51**, 208.—The concn. of alc. in the blood is proportional to the toxic effect produced; there is a close relationship between the concn. of alc. in the blood and in the urine, and one can be deduced from the other. In the tests described the blood samples were taken from a vein, and the alc. was detd. by distn. and oxidation with dichromate and expressed as mg. per 100 g. of blood. The concn. curve of blood and alc. rose very rapidly (in about 1 hr.) to its max., and slowly came down, about 12 hrs. being taken to return to normal, which was probably zero. The rate of disappearance was practically a straight line. The glucose curve rose with equal rapidity, but fell within about $1^1/_2$ hrs. to the normal of about 80 mg. per 100 g. The kidneys could keep back glucose until it reached a high percentage in the blood, but had not this power for alc. The tolerance of individuals varied very much according to their habits. Yet the factor of personal idiosyncrasy was very great, and it was impossible to be certain from the percentage in the urine how much alc. had been taken. With whiskey the concn reached a higher max. much more quickly than with stout of the same alc. content, had a greater effect on the subject and passed off more quickly. Toxicity was measured by the subjects' ability to draw a square, with its diagonals, inside a circle. The concn. of alc. in the urine passes that of the blood almost at once, and maintains a fairly const ratio towards it (1.35-1.45), whatever food is taken and whatever urine is passed. This point is important, as the evidential value of the test depends upon it. A sample of urine taken some time after arrest would naturally not show the same concn. as at the time of arrest. To find this, the test might be standardized, another sample of urine being taken at a measured time afterwards, and the concn. at the time of arrest plotted on the resulting curve, the time between arrest and the taking of the first sample being known. Any standard devised should be based on behavior tests made with individuals of varying tolerance, each of whom had a dose that would make his concn. the same as that of the others. This test would show what was the av. concn. beyond which a person was not fit to be in charge of a car. E. H.

Nephelometry of blood lipoids. G. BLIX. *Biochem. Z.* **167**, 313-20(1926); cf. *C. A.* **19**, 1876.—The method of Bing and Heckscher (cf. *C. A.* **19**, 2218) for detg. the lipoid content of a "primary ether ext." is not exact, as a number of variable factors influence the turbidity of the suspension obtained. W. D. L.

Measurement of the actual reaction of capillary blood by use of the quinhydrone electrode. R. SCHAEFER. *Biochem. Z.* **167**, 433-9(1926); cf. *C. A.* **19**, 2681.—By the use of a Pt wire as an electrode, a KCl-agar mixt as a salt bridge and the quinhydrone electrode as reference, the p_H of capillary blood from the finger tip may easily be detd. Capillary blood has the same p_H as arterial blood. W. D. L.

Resorption from the isolated surviving intestine. I. Method. F. LASCH. *Biochem. Z.* **169**, 292-300(1926).—One end of an isolated strip of intestine from the guinea pig is tied to a Y canula so that it may be filled with a soln. of the substance to be dialyzed, and the other is tied to the recorder of a kymograph so that contractions of the intestine can be measured. The intestine is then placed in a bath of Ringer. soln. through which O is bubbled. Samples from the intestine may be removed for analysis through one arm of the Y, and the original pressure inside established by allowing more fluid to flow from a leveling bulb through the 2nd arm of the Y. Preliminary expts. show that the amt of Ca which passes through the intestinal wall varies with changes in the amt. of NaCl present in the soln., *e. g.*, if 0.9% NaCl is present, 230% more Ca passes through than when no NaCl is present. W. D. L.

A colorimetric method for the estimation of blood calcium. J. H. ROE AND B. S. KAHN. *J. Biol. Chem.* **67**, 585-91(1926).—The method is based upon the pptn. of Ca as phosphate and the detn. of the phosphate by the molybdic oxide colorimetric method of Benedict and Theis (*C. A.* **18**, 3398) slightly modified. The method is very accurate and is a successful micro-procedure adaptable to much smaller amts. of serum than other methods in present use. A. P. LOTHROP

The titration of organic acids in urine. W. W. PALMER. *J. Biol. Chem.* **68**, 245-9(1926); cf. *C. A.* **14**, 1689.—A more extended use of the method to det. org. acids in pathol. urines has brought to light new limitations and sources of error which are discussed. All protein must be removed and phosphates and carbonates are pptd. by $Ca(OH)_2$ as before. Tropeolin 00 is the most satisfactory indicator for general use, but occasionally specimens contain some unknown substance which produces

fading near the end point and such specimens should be checked with another indicator, preferably bromophenol blue. A. P. LOTHROP

Electrical conductivity, electrical potential and hydrogen-ion concentration measurements on the submaxillary gland of the dog recorded with continuous photographic methods. D. W. BRONK AND R. GESELL. *Am. J. Physiol.* **77,** 570-89(1926).—Visible secretion of the submaxillary gland was always accompanied by increased elec. resistance and an increased acidity of the venous blood. Elec. potential changes were variable unless the most stringent precautions were observed. App. is described and the significance of the results is discussed. J. F. LYMAN

The volume of blood in the heart and lungs. C. K. DRINKER, E. D. CHURCHILL AND R. M. FERRY. *Am. J. Physiol.* **77,** 590-624(1926).—A method for detg. the cardiopulmonary blood vol. in a heart-lung prepn. is described. Increase in inflow into the right ventricle was the only means which increased the pulmonary blood vol. Changes in blood CO_2 and O_2 and changes in ventilation of the lungs were without effect unless accompanied by an increase in blood flow. J. F. LYMAN

A dye method for determining the blood volume in man. J. LINDHARD. *Am. J. Physiol.* **77,** 669-79(1926); cf. *C. A.* **20,** 2514.—A satisfactory method is based upon (1) the intravenous injection of 2.5 to 4 cc. of 1% vital red soln., (2) thorough mixing of the dye with the systemic blood by walking and arm exercises, (3) the colorimetric detn. of the dye in the blood plasma, and (4) the plasma vol. Double detns. on the same subject agree within 200 cc on an av. 50 ± 10 cc. The total blood vol. in 11 men by this method was on an av. 4.9% of the body with variation from 4.2 to 5.9%. J. F. LYMAN

The use of light filters in colorimetry with a method for the estimation of hemoglobin. R. P. KENNEDY. *Am. J. Physiol.* **78,** 56-63(1926).—Color filters were used in a colorimeter of the Dubosq type for the detn of hemoglobin with an av. deviation of 2.9% between this and the O_2 capacity method. J. F. LYMAN

The regulation of respiration. III. A continuous method of recording changes in acidity applied to the circulating blood and other body fluids. R. GESELL AND A. B. HERTZMAN. *Am. J. Physiol.* **78,** 206-23(1926).—A MnO_2 electrode placed directly in the blood stream was used. J. F. LYMAN

The determination of the hydrogen-ion concentration of the blood. L. E. BAYLISS, PHYLLIS T. KERRIDGE AND RUTH C. VERNEY. *J. Physiol.* **61,** 448-54(1926).—No systematic differences were noted between the detns. of p_H of the blood by (1) the H electrode, (2) the glass electrode and (3) the Dale-Evans colorimetric method. The probable error of the mean reading on a given sample was (1) for the H electrode 0.003 p_H (mean of 4) and (2) for the glass electrode 0.008 p_H (mean of 3) and (3) for the colorimetric method 0.011 p_H (mean of 4). J. F. LYMAN

The colorimetric determination of hydrogen-ion concentration. J. H. SHAXBY AND O. M. JONES. Proc. Physiol. Soc., *J. Physiol.* **61,** xxvi(1926).—In detg. the p_H by the colormetric method of Dale and Evans with neutral red as indicator, it is essential that the vols. of buffer and unknown soln. be equal as well as that the same amt. of indicator be used in each. J. F. LYMAN

A labor-saving device for use in gas analysis. F. A. DUFFIELD. Proc. Physiol. Soc., *J. Physiol.* **61,** xxix(1926).—The app. consists of a pulley having an extension arm eccentrically attached to its side, the other end of the arm being fastened to a block which slides up and down on a rod with each revolution of the pulley. The device is used to raise and lower the leveling bulb of the Haldane gas analyzer when absorbing O_2 in the pyrogallol pipet. J. F. LYMAN

Determination of reducing substance in the blood. S. JONSELL, E. JORPES AND N. SIKSTRÖM. *Acta med. Scand.* **63,** 446-77(1926).—In a comparative study of the Schaffer-Hartmann and the Hagedorn-Jensen methods for the detn. of the blood sugar, the former gave somewhat higher percentages, the discrepancy between the 2 methods increasing as the blood sugar concn. diminished. This fact may explain why the blood sugar percent in insulin intoxication in rabbits has been estd. as 0.045% (Schaffer-Hartmann) or as 0.03% (Hagedorn-Jensen and Bang methods). The method of Hagedorn-Jensen is recommended as the most suitable for work on a large scale. However, since the volatilization of I_2 is sufficient to produce considerable error, it is suggested that the KI, NaCl and $ZnSO_4$, which are added after reduction in a water bath has been brought about should be supplied to only a small no. of tubes before titration. HCHO cannot be used to preserve the blood intended for analysis. By the use of NaF and thymol blood may be preserved even for a week when the sugar is detd. by the Schaffer-Hartmann method using the Folin-Wu ppts. but not for analysis by the Hagedorn-Jensen procedure. However, blood may be taken directly into stoppered

10-cc test tubes, contg 6 cc. tap water to which has been added 0 05 cc. of 2 *N* NaOH, then 0 05 cc of a 45% $ZnSO_4$ soln, and the sugar values remain unchanged for 72 hrs. if the tubes are kept at room temp. For the Schaffer-Hartmann method it was found that the empirical table could be dispensed with. One should endeavor to obtain as far as possible an intensity of boiling which for the values 0.1 and 0 2% glucose in the table could yield $Na_2S_2O_3$ titration figures of 3 00 and 6 40 cc, resp. If these values have been obtained it will never be necessary to use the table because the Schaffer-Hartmann curve corresponds with sufficient accuracy to the equation $X = (3y + 1)/100$, where x represents the percent of glucose and y the amt of 0 005 *N* $Na_2S_2O_3$ in cc. The no of cc. $Na_2S_2O_3$ soln used in the titration is multiplied by 3, and added to 1; the decimal point is moved 2 points to the left, giving the percent S. MORGULIS

A clinical method for the quantitative estimation of salicylic acid in blood serum and in cerebrospinal fluid. KARL LOBERG *Biochem Z* **170,** 173-84(1926).—To remove protein, dil. the serum (cerebrospinal fluid is not dild) and add 1/3 its vol. of 20% CCl_3COOH and twice as much 92% alc The salicylic acid is thus completely retained in the filtrate Both the filtrate and the salicylic acid standard (0 02% soln.) must be neutralized with *N* NaOH and again acidified to the same p_H by means of 2% CCl_3COOH, which is essential for the proper development of the color. To compensate for the slight color differences in unknown and in standard, 0.05 cc of a 0 02% Bismark Brown soln is added to the standard The color is developed with 0 3 cc. of a 5% $FeCl_3$ S MORGULIS

The estimation of cellulose in human feces and the digestion of food cellulose. TEISUKE KOHMOTO AND SHOYO SAKAGUCHI *J Biochem* (Japan) **6,** 61-76(1926).—Digest 3 5 g sample in a beaker with 200 cc 2 5% KOH for 1 hr on the water bath. Neutralize with 50 cc H_2SO_4 and 150 cc H_2O, and after the further addition of 10 cc. H_2SO_4 heat for another hr. Filter still hot through a Gooch crucible In place of the usual asbestos pad it is recommended to use a piece of fine linen placed over a very thin layer of asbestos Wash the residue with hot H_2O and hot alc until the filtrate comes through clear and colorless, then wash with a mixt of alc and ether. Remove the linen pad to a beaker and wash off the residue with H_2O to give a vol of 100 cc., add 6 cc of 5% NaOCl, stir and after 15 min filter through a weighed paper (S. & S No 589), wash with hot H_2O, and, to remove the last traces of alkali, treat with 20 cc. 1% AcOH Wash again with hot H_2O, hot alc and ether, place the filter paper in a tared weighing bottle and dry at 105° The loss of cellulose occasioned by this procedure is only 5 8% as compared to 8 9% by Weender's method Feeding expts on 12 persons with a daily intake of 8 5% of their food in the form of cellulose showed that 75% of this material was digested and absorbed The following amts of cellulose were found for a number of foods which have been air dried before analysis: rice 0.465, bread 0 318, hard bread 0 334, potato 1 901, sweet potato 2 691, beans 5 2%. S. MORGULIS

Comparative study of various urine preservatives. GUIDO TOTTERMAN AND OSSIAN UTTER *Skand. Arch. Physiol.* **48,** 72 9(1926).—The preserving effects of thymol, $CHCl_3$, toluene and a soln of thymol in $CHCl_3$ were compared on a number of urines, both normal and excessively acid or alk The p_H of the urine was used as the indicator of the efficiency of the preservative, the tests being carried out over periods of many months. All 3 preservatives are practically of the same value provided the added $CHCl_3$ or toluene is not allowed to evap Urines in which fermentation has already set in can no longer be preserved by these antiseptics. The most effective concns. to use are: 5 cc toluene, 2 5 cc $CHCl_3$ or 2 g. thymol per l. urine, or 5 cc of a 10% thymol soln. in $CHCl_3$ (Folin's mixt) S. MORGULIS

The centrifuge method of determining protoplasmic viscosity. L. V. HEILBRUNN. *J. Exptl. Zool.* **43,** 313-20(1926).—In this method the movement of granules or introduced foreign substances in living cells is observed after centrifuging for a detd time The following form of Stokes' law is used in computing the absolute viscosity: $V = 2cg(\sigma - p)a^2/9n$, in which c is the centrifugal force in terms of gravity, g the gravity const, a the radius of the granule, n the viscosity, σ the sp. gr. of the fluid through which the granules move, and p the sp. gr. of the granules. Directions are given for the direct detn. of σ and p. The movement of the granules through the protoplasm has no effect on the viscosity measurement. CHAS H. RICHARDSON

A convenient method for the formol titration. J. H NORTHROP. *J. Gen. Physiol.* **9,** 767 9(1926) -*Neutral standard*—To 5 cc. of the soln add 1 cc. 0 05 *M* Na phosphate soln. and 1 drop dil neutral red soln Titrate with acid or alkali to a sharp end point (usually about p_H 7) *Alkaline standard.*—Mix 5 cc of the soln, 1 drop neutral red soln, 1 drop 0.1% phenolphthalein soln, and 1 cc. 40% HCHO soln, add 0 01 *N* NaOH

until the max. color is developed (p_H about 8.5). *Titration of the soln.*—Add 1 drop neutral red to 5 cc. of the soln. and titrate to match the "neutral standard" Add 1 cc. HCHO soln. and 3 drops of 0.2% phenolphthalein soln. and titrate with 0.01 *N* NaOH to match the "alkaline standard." The amt. of alkali necessary to bring the soln. from the neutral to the alk. standard is the titration figure, and in the case of amino acids and simple dipeptides, agrees closely with the alkali equiv. of the substance. A blank test on the HCHO soln. is obtained by using H_2O instead of the soln. to be tested. With solns of pure amino acids or peptides the titration to the neutral standard may be omitted. In the case of amino acids the titration value agrees with the total alkali-combining capacity of the amino acid. If the alkali reacts with the free COOH groups, the figure gives the normality of these groups present. If amphoteric ions are present (Bjerrum, *C A.* **17,** 2379) the figure obtained is the NH_2 group equiv. C. H. R.

Rapid method for the preparation of pure and stable methemoglobin. V Balthazard and P. Condrea. *Ann. méd. légale* **6,** 320-4(1926).—Quagliarello (*C. A.* **16,** 3906) has shown that weak acids rapidly convert oxyhemoglobin (I) into methemoglobin (II) at 38°; but the results are unreliable and transformation is seldom complete, the blood becoming reducing and partially reconverting II into hemoglobin. This is avoided by adding an equal vol. of glycerol to the defibrinated blood. Doumer and Fourrier (*C A.* **20,** 2000) used glycerosols for the preservation of blood pigments and considered II could be formed in presence of neutral glycerol. B. and C. show that the formation of II is dependent on the acidity of the medium. On addn of 1% AcOH to the blood-glycerol mixt conversion of I into II is quant. effected in 3–4 hrs. at 38° and the soln. is stable, with smaller proportions of AcOH transformation is slower (complete in 3 hrs with 0 125%, in 48 hrs. with 0 06%), and may be incomplete with very low acidities The transformation was followed by B and Philippe's cyanometric method (*C. A.* **20,** 2342). A. Papineau-Couture

Effect of hydrocyanic acid and cyanide poisoning on the blood. V. Balthazard *Ann. méd légale* **6,** 330-4(1926).—In KCN and HCN poisoning, no formation of CN derivs. of blood pigments could be observed, whatever the method of administration of the poison The HCN or KCN in the stomach contents can easily be detected with certainty by their combination with methemoglobin (B. and Philippe, *C. A* **20,** 2342), and can be detd. in this way with sufficient accuracy for toxicological purposes. A Papineau-Couture

Rapid preparation of monomolybdophosphotungstic acid reagent for polyphenols and vitamins. N. Bezssonov. *Compt rend.* **182,** 1223 4(1926); cf. *C A.* **16,** 226 1782; **17,** 3684; **18,** 3207; **19,** 664 —Rapid prepn. of the reagent ($MoO_3.P_2O_5.17WO_3$ $24H_2O$) is based on its slight soly. in 6 *N* H_2SO_4, and is carried out as follows: in 250 cc. H_2O (distd. over $KMnO_4$) dissolve 74 g. Na tungstate, 8 g. phosphomolybdic acid and 10 cc H_3PO_4 (d. 1.75), warm to about 45°, add drop by drop 85 cc. H_2SO_4 (125 cc. dild to 250 cc at 15°), let cool, after standing 3 hrs. decant the mother liquor, wash the crystals (about 60 g. yield) with 50 cc of 15% by vol. H_2SO_4, dissolve in 100 cc. of redistd. H_2O, reppt. with 35 cc. of 50% by vol. H_2SO_4, and wash with 15% by vol. H_2SO_4 The purity of the crystals is tested and the soln. is prepd. as in the preceding paper (*C. A.* **17,** 3684) A Papineau-Couture

Differentiation of the individual components of tissues on the basis of their differing combining capacities for Congo red. A. Kreidl and E. Nirenstein. *Arch. ges. Physiol.* (Pflüger's) **212,** 642-44(1926). G. H. S.

Gentian violets and crystal violets. H. J. Conn. *Abstracts Bacteriol* (Proc.) **9,** 343–4(1925).—In order to bring about greater uniformity in nomenclature the Commission on Standardization of Biological Stains has drawn up the definition for gentian violet that it must be either hexamethyl-pararosaniline or pentamethyl-pararosaniline, or a mixt. of these 2 compds. with lower homologs of the same series having a shade at least as deep as that recognized in the trade as methyl violet 2 B. F. W. T.

Colorimetric determination of non-protein nitrogen of the serum. L. Cuny. *J. pharm. chim.* [8] **3,** 150-6(1926).—For the conversion of non-protein N into NH_3, the method of Grigaut and Thiéry (*C. A.* **16,** 2344) is followed; the NH_3 is then detd. colorimetrically by the phenol-NaClO method (cf Thomas, *C. A.* **7,** 2764; Orr, *C A.* **19,** 87). Neutralize the Kjeldahl product (from 1 cc. of serum) with 10% NaOH (phenolphthalein), then add at once 20 cc. of 5% PhOH soln. and fill up to 80 cc. To 25 cc. of a standard $(NH_4)_2SO_4$ soln. (1 cc. = 0.01 mg. N) add 1 cc. of the H_2SO_4-$CuSO_4$ soln , then NaOH and PhOH as before and again fill up to 80 cc. To each soln. add 20 cc. NaClO soln. (10°) and after 10–15 min compare the color intensities in a colorimeter. Check detns. showed close agreement. S. Waldbott

New process for the determination of acetone and its application to urine. P. FLEURY AND Y. AWAD. *J. pharm. chim.* [8] 3, 406–14, 449–57(1926).—To render the CHI_3 method specific for acetone (*A*), ppt. *A* previously by means of the Nessler (Bougault and Gros, *C. A.* **16**, 3281), or Denigès reagent (1899), then dissolve the ppt. in HCl with addn. of KI. The Nessler reagent (*B*) is preferred; for complete pptn. it must be used in large excess. Ppt. 5 cc. of the aq. soln contg. not more than 5 mg. of *A*, with 30 cc. of *B* (cf. B. and G.). After 20 min , centrifuge, decant and dissolve the ppt. (contg. 3.94% of *A*) in 2 cc. of 5 *N* HCl with addn. of 5 cc. of 20% KI. Add 10 cc. of 0.1 *N* I and 10 cc. of 27% NaOH; after 10 min., add 15 cc. 5 *N* HCl and titrate back with $Na_2S_2O_3$. Results agree well with those by direct titration. The use of *B* also permits *detn. of aldehyde and acetone in one operation*, based on the reduction of *B* by the aldehyde (cf. Gros, *C. A.* **19**, 1549). To the aq. soln. of the mixt. add excess of *B;* after 45 min , centrifuge, treat the clot with 2 cc. of 5 *N* HCl, filter, wash with 3 × 2 cc. H_2O and treat the filtrate for *A* as before, using 0 02 *N* $Na_2S_2O_3$ Transfer the filter with pptd. Hg to a dish, add 20 cc of 5 *N* HCl and 10 cc. 0 1 *N* I, and titrate the soln. with 0 02 *N* $Na_2S_2O_3$ From definite mixts of aldehyde and *A*, recovery was nearly quant. For the detn of *A* in *urine*, 3 methods are given: (*a*) a direct method involving double pptn. with *B*, 1st with special *B* (the KI content being doubled) to hasten oxidation of aldehydic impurities; treat the resulting gray ppt. with cold HCl, filter off the ppt., then re-ppt *A* with ordinary *B* and proceed as stated before. $AcCH_2CO_2H$, if present, must first be removed by short boiling under reflux; MeCH-(OH)CH_2CO_2H does not disturb the detn. of *A*. (*b*) A vacuum-absorption method is a quant. adaptation of the qual. method of B. and G (*c*) A distn. method is simple and gives the most exact results. To each 100 cc. of urine add 1 cc. of H_3PO_4 and boil in a current of steam. If the content of *A* is 0 5 g. per l., collect 10–15 cc.; if above 0.5 g. 20–25 cc Since volatile aldehydic impurities cause partial reduction of *B*, follow the above method of sepn. of aldehydes and *A* for the detn. of both the impurities and the pure *A*, except that the treatment with HCl must be conducted at low temp. Direct treatment of the distillate with I in alk. soln. gives the sum of aldehyde and *A* content. With pathol. urines, methods (*a*), (*b*) and (*c*) gave quite concordant results; normal urines showed from 0 to 1.5 mg. of *A* per l. S. W.

Analytical papers. IV Micro determination of ions in organs (PINCUSSEN, CRONHEIM) 7.

C—BACTERIOLOGY

A. K. BALLS

Effect of electrolytes on the rate of inactivation of bacteriophage during precipitation. J. BRONFENBRENNER. *Proc. Soc. Exptl. Biol. Med.* **23**, 187(1925).—Bacteriophage is usually carried down in the sediment when lytic filtrates are caused to ppt. In certain cases the lytic agent remains active and can be recovered by dissolving the ppt.; in other cases it becomes inactive. Acetone pptn. causes no inactivation if 1% NaCl is first added to the filtrate; 99% of the phage is lost within a short time. Univalent and bivalent salts antagonize one another in this respect. The effect of NaCl is diminished by the presence of $CaCl_2$. C. V. B.

The chemical study of bacteria. XI. The development of a systematic analytical method for the comparative study of bacterial cells. T. B. JOHNSON. *Am. Rev. Tuberculosis* **14**, 164–71(1926).—The primary object is to place on permanent record an outline of the exptl. procedure which has been developed and followed by the workers in the Yale Lab. in their study of the chemistry of tubercle bacilli. The possibilities and difficulties of applying org. chemistry to the study of bacteria are pointed out. A chart is presented for the chem. study of the N and P distribution of tubercle bacilli. H. J. CORPER

Biochemical investigations on Azotobacter agile. S. KOSTYCHEV, A. RYSKALCHUK AND O. SHVEZOVA. *Z. physiol. Chem.* **154**, 1–17(1926).—The 1st product of the fixation of mol N by *Azotobacter agile* is NH_3. Then NH_2 groups are formed as the 1st step in the protein synthesis. Not even traces of O-contg. N compds. are produced. This behavior is analogous to that of molds on a nitrate medium. N fixation, as well as nitrate utilization, is an extracellular reduction process which leads to NH_3 formation. De-amination of NH_2 acids is not performed by *Azotobacter* in the presence of sugar. Nitrates are vigorously reduced to NH_3 without loss of N. *Azotobacter* is, therefore, a typical reducing organism. Its action in the soil must be antagonistic to that of the nitrifying bacteria. When supplied with NH_4 salts or nitrates *Azotobacter* does not assimilate mol. N. Peptone, however, has a suppressing effect on N fixation only when

it is present in very large amts. Soil has a strongly stimulating effect on N fixation by *Azotobacter*. In the presence of garden soil the N yield amounted to 25 mg. for each g. of sugar consumed. In contrast to *Clostridium Pasteurianum Azotobacter* does not lose the capacity for N fixation after long-continued cultivation on synthetic media.
A. W. Dox

Lactic acid fermentation. III. A. I. VIRTANEN AND H. KARSTRÖM. *Z. physiol. Chem.* **155**, 251–8 (1926); cf. *C. A.* **19**, 1878; **20**, 1256.—Neither MeCOCHO nor $CO(CH_2OH)_2$ is fermented by *B. caseie* or *Streptococcus lactis*. MeCOCHO is slightly toxic to *B. casei*, although the organism retains its power of reproduction after remaining 12 hrs. in a 1% soln., while $CO(CH_2OH)_2$ is non-toxic. *Str lactis* is more resistant than *B. casei* toward MeCOCHO. *B. coli* produces acid from both of these 3-carbon compds. The increase in acidity, however, calcd. as lactic acid, accounts for only a small part of the $CO(CH_2OH)_2$ fermented This organism is more resistant than the lactic acid bacteria to MeCOCHO and survives a 2% soln. 40 hrs. The fact that $CO(CH_2OH)_2$ as well as MeCOCHO is fermentable does not support the view that the latter alone should be considered as an intermediate in coli fermentation. A. W. Dox

Coproporphyrin synthesis by yeast and factors which influence it. IV. HANS FISCHER AND HANS HILMER. *Z. physiol. Chem.* **153**, 167–214(1926); cf. *C. A.* **20**, 769.—Yeast in pure culture synthesizes coproporphyrin from a porphyrin-free medium. In the presence of an Fe salt the formation of a hemin complex is shown by an intense hemochromogen spectrum. The pyridine ext. of freshly germinated barley also gives this spectrum. Hemin is probably the primary constituent here and is found almost exclusively in the roots. Both hemin and coproporphyrin are normal constituents of yeast, the proportions varying with the nature of the substrate. On a synthetic medium the yeast behaves in this respect like a porphyrinuria patient in its inability to form any considerable amt. of the Fe complex. Even in the presence of Fe other conditions may result in a preponderance of coproporphyrin. After autolysis or putrefaction hemin is still present in traces in spite of a large increase in coproporphyrin. From 1 kg. of autolyzed yeast the porphyrin may be obtained in cryst. form as its ester, and from 5 kg. the yield is sufficient for analysis. On the other hand, the cryst. ester could not be obtained from fresh yeast. In no case could coprohemin be demonstrated, and it is probable that the coproporphyrin is formed by a secondary synthesis from normal hemin. The precursor of the coproporphyrin may possibly be cytochrome The coproporphyrin excreted in human urine probably originates from muscle pigment rather than from blood pigment, since the feeding of blood gives no greater increase than serum alone. The presence of coproporphyrin in most vegetable foods accounts for the failure to obtain urine or feces entirely free from this substance even on a strict vegetarian diet. A. W. Dox

The influence of different salts and acids upon the growth of the cider sickness bacillus. OTTO GROVE. *Univ. Bristol Ann. Rept. Agr. and Hort. Research Sta.* **1923**, 106–7, *Botan. Abstracts* **15**, 338.—It is known that acids inhibit or prevent the growth of this bacillus in cider; and it is thought by some that a low salt content in the cider favors the growth of the bacillus. Trials with cultures of this organism in yeast water contg. 5% glucose indicated that while all acids at concns as low as 0.5%, H_2SO_4 0.05%, salicylic acid 0.07%, and tartaric as low as 0 3% prevented its growth; the salts, K tartrate, KCl, K_2SO_4, Na_2SO_4, $CaSO_4$ and $CaCl_2$ at concns. of 1% did not prevent growth. Growth was prevented by NaCl at a concn. of 0.7%, Na benzoate at a concn. of 0.5% and $MgCl_2$ at a concn. of 0.3%. H. G.

Are proteus bacilli that have been grown upon phenol agar really non-motile and free from flagella? FRANZ NEUMANN. *Klin. Wochschr.* **5**, 1085–6(1926).—The small concn. of phenol in phenol agar does not change the proteus bacillus so that it becomes non-flagellated. The flagella are easily demonstrable. The activity of the flagella is, however, so reduced that the organisms, while still motile, are not actively so.
MILTON HANKE

Vitamin and bacteria. WERNER KOLLATH. *Klin. Wochschr.* **5**, 930–2(1926).—*B. influenzae* Pfeiffer requires 2 substances for its normal development namely an X factor, which is an Fe-contg. substance of which hemoglobin is an example, and a V factor, which has properties similar to the vitamins. Both substances are contained in normal blood and in most plants. The X substance is not destroyed by boiling and is required only in very small amts. The V substance is destroyed by heat, is present in the blood cells, can be liberated from the cells by autolysis and is normally not present in blood serum. The influenza bacillus requires about 10 times as much V substance as it does X substance. Normal serum contains an enzyme that destroys the V substance. Scorbutic serum contains more of the enzyme than does normal serum. Cer-

tain of the air bacteria have the faculty of producing both the X and the V substances. They can produce the X substance only when Fe salts are present. The influenza bacillus will, therefore, grow in the midst of other bacterial colonies on a medium that would, ordinarily, not be a good culture medium The V substance produced by bacteria is not identical with any of the known vitamins. MILTON HANKE

Equilibrium between *l*-aspartic acid, fumaric acid and ammonia in presence of resting bacteria. J. H QUASTEL AND BARNET WOOLF. *Biochem. J.* **20,** 545–55 (1926) - *l*-Aspartic acid is formed in a soln. contg. Na fumarate, NH_4Cl and resting bacteria, no amino acid being synthesized in the absence of the bacteria. The yield of *l*-aspartic acid may be as high as 60% of the fumaric acid taken. A small amt. of aspartic acid is synthesized from malic acid, but none from maleic acid. In presence of resting *B coli*, aspartic acid rapidly liberates NH_3 with the formation of fumaric acid. As the latter slowly gives rise to malic acid, in presence of bacteria, it follows that aspartic acid presents an instance of an *l*-amino acid proceeding to the corresponding hydroxy acid *via* the unsatd acid. The constant for the equil (controlled by a thermolabile mechanism) *l*-aspartic acid $\rightleftharpoons$ fumaric acid + ammonia has been found. Under conditions such that aspartic acid liberates NH_3 in the presence of *B coli*, glutamic acid and glycine are inert. BENJAMIN HARROW

Removal of acid-fastness from tubercle bacilli by oleic acid or olive oil. F. A. MCJUNKIN. *J Infectious Diseases* **38,** 520 3(1926).—Cultures of tubercle bacilli dehydrated with acetone or alc. lose their acid-fastness upon incubation with oleic acid. Cultures dehydrated with acetone lose their acid-fastness upon incubation with olive oil but those dehydrated with alc do not The loss of acid-fastness is incomplete in either case, but less than 1% of the bacilli retain their property of staining red with the Ziehl-Neelson method The few bacilli that remain acid-fast are thought to be dead at the time of incubation Traces of H_2O are necessary for the discharge of acid-fastness The H_2O adheres to the dehydrated cultures in the oily medium The temp at which the loss of acid-fastness takes place most rapidly is 37° with an abrupt cessation at a lower temp where the metabolic activities of the bacilli are greatly reduced; and at temps. above 37° which approach the thermal death point of the cultures The variations in the reaction with changes in temp are not those to be expected were the process a simple chem one JULIAN H LEWIS

A method of increasing the virulence of Clostridium chauvoei by the use of ferric salts. J. P SCOTT *J Infectious Diseases* **38,** 511-3(1926).—The addn. of 0.2% $FeCl_2$ to culture media prevented virulent cultures of *Cl. chauvoei* from losing their virulence Avirulent strains regained their virulence JULIAN H. LEWIS

Cellobiose fermentation by coli-aerogenes group. S. A KOSER *J. Infectious Diseases* **38,** 506–10(1926) —In the fermentation of cellobiose, an uncommon sugar considered to be 5-glucose glucoside, the differentiation of intestinal *B. coli* and the aerogenes-cloacae group is quite distinct But with the so-called intermediate forms obtained from soil a correlation between all the tests is not obtained J H. L.

The dependence of alcoholic fermentation upon hydrogen-ion concentration. IV. ERIK HAGGLUND AND ANNE M AUGUSTSSON *Biochem. Z* **170,** 102–25(1926).—Live yeast ferments pyruvic acid only in high H-ion concns This seems to depend upon the fact that the acid permeates very slowly through the cell wall. Drying causes a change in the cell permeability The most favorable H-ion concn for the activity of the carboxylase is the same as the optimum p_H for the fermentation of sugar. But the fermentation of pyruvic acid by dry yeast proceeds even in a neutral or alk. medium though much more slowly than at the optimum p_H In the fermentation of pyruvic acid by yeast exts , the process practically stops on the alk. side of neutrality, whereas at a p_H 6 the fermentation is very active, and it would seem as if the action of the free "zymase" is different from that of dry yeast which is attributed to the greater H-ion concn within the cell It is clear, however, that carboxylase has a very sharply demarcated optimum at $p_H = 6$. The failure of pyruvic acid to undergo fermentation at $p_H > 7$ is thought to be related to the presence of the acid in the keto or enol form, the proportion of these 2 forms being dependent upon the H-ion concn. The fermentation of pyruvic acid is not so rapid as that of sugar, even at the optimum p_H. The slow rate of fermentation is due to the formation of CH_3CHO, which acts deleteriously. S. MORGULIS

Physiological studies on accessory and stimulating factors in certain media. J. R. SANBORN. *J. Bact.* **12,** 1–11(1926).—The physiol. efficiency of cellulose-decompg. organisms is markedly influenced by the compn. of the medium in which they grow. Sterilization with the autoclave so changes the compn. of maple leaves that the action of cellulose-destroying organisms upon them is considerably slowed. The essential

food factor (vitamin B ?) exerts a stimulating effect upon the growth and physiol efficiency of *Cellumonas folia* The essential food factor contained in exts. of seeds and seedlings of alfalfa, barley and buckwheat exerts a marked stimulating effect on the organism. The detn. of H-ion concn changes during cellulose decompn serves as a criterion of the physiol. activity of *C folia* JOHN T. MYERS

The effect of surface tension upon the growth of Lactobacillus acidophilus and Lactobacillus bulgaricus. W R. ALBUS AND G E. HOLM *J Bact* **12,** 13-8(1926) — In the media employed in which Na ricinoleate was used as a depressant, *L. bulgaricus* was inhibited at a surface tension lower than 40 dynes while *L acidophilus* grows well in the same media depressed to 36 dynes It is a plausible assumption that surface tension may be a factor in implantation of these organisms JOHN T MYERS

Studies in bacteriosis. XIV. Chemical agglutination as a means of differentiating bacterial species causing soft rot of potatoes and other vegetables. E. M. BERRIDGE. *Ann. Appl. Biol.* **13,** 12-8(1926). —Chem. agglutination tests show that *B. solanisaprus* and *B. phytophthorus* are not identical organisms, but are both closely related to *B carotovorus.* These tests were found to be as reliable as serum agglutination tests in this group of organisms. C. H. R.

Bacterial filters. S. P. KRAMER. *J Gen Physiol.* **9,** 811-2(1926) —Bacteria and viruses are divided into filterable or non-filterable on the basis of their ability to pass through the pores of filters However, the basic dye, Victoria blue, will not pass through a Berkefeld filter, whereas Congo red, an acid dye, readily passes through. The filters used in bacteriol practice consist of some compd of silicic acid. A filter is in reality a suspension of the material of which it is composed in the fluid that is being filtered SiO_2 bears a negative elec charge Filters made of plaster of Paris readily permit the passage of Victoria blue, but not of Congo red If, however, a dil soln of Congo red is made slightly acid it will now pass through the plaster of Paris filter but not through a Berkefeld filter In other words, reversing the elec charge on the dye reverses its filterability The bacteriophage of *Staphylococcus aureus* which passes through the Berkefeld filter does not pass through the plaster of Paris filter. *Vibrio percolans* (of Stuart Mudd), vaccine and rabies viruses pass through the Berkefeld but not the plaster of Paris filter Filters made of pure calcined $CaSO_4$, which is elec neutral, had no action on the colloid dyes or microörganisms used. Com plaster of Paris contains as much as 5% $CaCO_3$. When $CaCO_3$, which is elec. positive, was added to pure $CaSO_4$, the mixt had the same filtering properties as com plaster of Paris Probably $CaCO_3$ is the active adsorbing component of the plaster of Paris filter and the $CaSO_4$ acts as a binder for it C. H. R.

Toxicity of acids towards yeast. E M TAYLOR *Trans Roy. Soc Canada* [iii] **18,** III, 115(1924).—The min quantities of the various salts needed to ensure the normal rate of reproduction of yeast in various synthetic media consisting of sugar and salts with addn. of bios I and bios II depend on the nature of the bios prepns. The mechanism of the toxic action of acids in aq soln. is wholly different from that of phenol. On adding yeast-cells to acid solns., the H ion concn. of the latter falls almost immediately. This is ascribed to the action of an exudate from the cells, which "may be said to bleed to death" The later portions of the exudate contain bios I and II. B. C. A.

Preparation and purification of bios. I. H. DES B. SIMS. *Trans Roy Soc. Canada* [iii] **18,** III, 116(1924) —An infusion of tea dust in Pb acetate soln is filtered and the bios pptd. by adding NH_3 and Pb acetate. The bios is brought into soln. by treating the washed ppts with CO_2. After removal of Pb by means of H_2S, cryst. material with bios activity is thrown down by the addn of MeOH. B. C. A.

Formation of bios in infusions. E. V. EASTCOTT. *Trans. Roy. Soc. Canada* [iii] **18,** III, 117-8(1924) —Comparison of the yeast crops from infusions of ground barley with those from infusions of the same no of barley grains after some days' sprouting, shows that the crop depends on the length of time grain and water have been left together in prepg. the infusions. The amt. of bios I increased to a much greater extent than that of bios II when the infusion was prolonged. If maize be used instead of barley, it is the bios II which increases. B. C. A.

Origin of carbamide produced by lower fungi. N. N. IVANOV. *Biochem. Z.* **162,** 425-40(1925).—The carbamide formed by pure cultures of several lower fungi arises from arginine and not from other amino acids. When arginine is the source of C and N during the growth of *Aspergillus niger,* half of the N appears as NH_3 and half as carbamide. These urease-free cultures can be used for the detn. of arginine in proteins and their degradation products. B. C A

"**Means for producing sulfofying bacteria.**" J. G. Lipman. Can. 259,115, Mar 23, 1926. A culture medium for S oxidizing bacteria comprises a phosphate, a N compd., a sol. Fe compd. and S.

D—BOTANY

B. M. DUGGAR

Observations on the metabolism of the corallines. L. Irving and L. B. Becking. *Proc. Soc. Exptl Biol. Med.* **22**, 162-6(1924).—Weighed amts. of *Corallina*, free from epizoa, were placed in Pyrex flasks along with unfiltered sea water. Outside air satd. with H_2O vapor was kept bubbling through the sea water; this kept the p_H const. for 50 hrs. or more. Three such flasks were exposed to a 75 watt Mazda lamp at 50 cm.; 3 flasks were kept in darkness Total excess base (X-base) was detd. by titration with 0 1 N HCl, methyl orange being used. The end point was p_H 4.0. The X-base changes correspond to the Ca^{++} removal. The reaction in light was closely expressed by the monomol. reaction equation, log $13/(13 - X) = 2\ 9 \times 10^{-5}t$. The reaction in the dark can be duplicated by E. Schutz's law in which $X = 1.5\sqrt{t}$. C. V. B.

Starch grains of wheat considered as partially dehydrated amylose. H. L. van de Sande Bakhuyzen. *Proc. Soc. Exptl. Biol. Med.* **23**, 195-7(1925).—About 60% of wheat starch grains is sol. in cold water when ground for several days in a pebble mill. It is assumed that the grain consists of concentric rings of α-amylose which is less dehydrated and is insol in water at 100°, and β-amylose which is more dehydrated and is sol in cold water. There is only a quant. difference in hydration between them. C V. B.

The direct influencing of plant cells by the hydrogen-ion concn. of the nutritive substrata. W. Mevius. *Z. Pflanzenernahr. Düngung* **6A**, 89 98(1925).—M. shows the fallacy of measuring the H-ion concn of expressed sap of plants, pointing to the variations in the p_H values of different types of cells and the possibility of reactions taking place during the course of the expression of the sap. M. regards the direct measurements of the H-ion concn of the different cells to be much more accurate, thus by the introduction of suitable indicators in the cells or in the large cells withdrawing the protoplasm (method of Crozier). M. points out that from such studies it has been shown that the H-ion concn. of the cell sap is more or less const and independent of the p_H of the substrata (within given limits). Where there is a change in the reaction of the cell sap—the cell is usually injured From other investigations M. concludes that the permeability of cells is dependent upon the H- or OH-ion concns of the nutrient medium and also that the kind, no. and proportions of the other ions in the soln. and the temp. influence the absorption processes. R. M Barnette

The possibility of hybridizing species, not closely related, by means of ionolysis. Alberto Pirovano. *Atti accad Lincei* [6] **3**, 762 7(1926).—Any modification of the character of a hybrid species must be brought about before fecundation, and therefore in the expts. described pollen was subjected to elec treatment before crossing with another species. It has already been shown (cf *Rend. accad Lincei* [6a] **2**, 217(1925)) that rays of short wave length or Ra emanation alter the mols. of the germ plasma to such a degree that the vitality and sp. characteristics are eventually destroyed. In the new expts. a new, far milder form of ionization is utilized, to which the term *ionolysis* is applied. The pollen is subjected to an intense, pulsating magnetic field produced by special annular electromagnets, whereby the mol. forces in the germ plasma undergo changes which result in new aggregations and different mol. orientation. The ionolysis leaves intact the chromosome structure and, unlike x-rays or Ra emanation, causes only superficial changes in the colloidal mol. aggregates. Moreover in ionolysis the frequency can be altered, so that the most favorable conditions for hybridization and at the same time preservation of vitality can be chosen, thus offering a new field of research. The dominance of the masculine factor can be annulled by ionolization (cf. P., *La mutazione elettrica delle specie botaniche*, Milano **1922**). Ionolytic treatment also renders incompatible species capable of producing a hybrid and aids the symbiosis of the heterogeneous idioplasmic elements, *e. g.*, accomplishes the hybridization of the peach and brier rose. Ionolysis probably n some way renders the mols. less stable or more reactive. C C. Davis

Toxic relations of other crops to tomatoes. W. H. Alderman and J. A. Middleton. *Proc. Am. Soc. Hort. Sci.* **1925**, 307-8.—Little or no evidence could be demonstrated of a toxic effect upon tomatoes of seepage water from trays contg. various cover crops. In fact increases over the checks were obtained in all cases, with the

exception of blue grass, in the following decreasing order: rape, rye, red clover, buckwheat, vetch, alfalfa, peas, soy beans, check and blue grass. P. R. DAWSON

Relation of leaf area to growth and composition of apples. M. H. HALLER AND J. R. MAGNESS. *Proc. Am. Soc. Hort. Sci.* **1925,** 189–96.—A higher % of dry wt., sugars and acids is associated with apples grown with a large leaf area as compared with those of the same variety grown with a small leaf area. P. R. DAWSON

Influence of metallic salts on the color of Monascus purpureus Went. SYÔZI HAGIWARA. *Rept. Dept. Industry, Govt. Research Inst. Formosa* **5,** 1–5(1924) (Japanese); *Botan. Abstracts* **15,** 326.—If one adds to a pure culture of *Monascus purpureus* a min. quantity of a salt of As, Sb or Zn, a beautiful, deep red color soon appears in the filaments, while the addn. of a salt of Sn induces a dark reddish orange color. H. G.

Oxygen requirements of plant roots. A. KUDRYASHEVA. *Sci. Agron. J.* **1,** 48–67 (1924); *Botan. Abstracts* **15,** 180.—K. used sterile cultures prepd. according to the method of I. S. Shulov. The nutritive soln. (Hellriegel's mixt.) was satd. with O. Prior to the expt. the amt. of O in the soln. was detd. The changes in this amt., after the expt. had been concluded, enabled K. to ascertain how much O had been consumed by the roots of the plants. The amt. of O was detd. according to the method of Winkler. There were used in the investigation oats, wheat, peas, buckwheat, flax, sunflower and mustard. Conclusion: The roots of a plant require much O and consume it immediately. Thus, *e. g.*, the O requirements of maize per g. of dry substance are expressed by 0.38 mg.; for peas, 1.37 mg. The curve showing the consumption of O by the roots reaches its max. at the period of flowering. In the presence of a deficiency of O, the roots of the plants take it from oxidized compds. which leads to a formation of NO_2 in the soln. and entails chloroses of the plants. H. G.

Chemical changes accompanying tuberization in potato. J. T. ROSA. *Proc. Ann. Meeting Potato Assoc. America* **11,** 107–8(1924); *Botan. Abstracts* **15,** 456.—Analyses were made of different portions of the plant just before and during tuberization. The dry matter content in all parts of the plant except above-ground stems increased rapidly. In the underground stems the glucose and sucrose content is high prior to stolon formation, low during this period, and increases when the tubers begin to form. Starch is practically absent at first in all parts of the plant but increases rapidly in the underground stems and leaves. Total acid-hydrolyzable polysaccharides are low at first but increase as tuberization begins. Total N is at a max. in the early development and decreases rapidly throughout the remaining stages. H. G.

The physiology of the nutrition of fruit trees. I. Some effects of calcium and potassium starvation. C. E. T. MANN. *Univ. Bristol Ann. Rept. Agr. and Hort. Research Sta.* **1924,** 30–45; *Botan. Abstracts* **15,** 453.—Cox's Orange apple trees on broad-leaved Paradise roots were grown in washed silver sand in waxed pots. One series was watered with a complete nutrient soln.; 1 series with a nutrient soln. from which K was omitted, $NaNO_3$ being substituted for KNO_3; and 1 series was watered with a soln. from which Ca was omitted, Na_2SO_4 being substituted for $CaSO_4$. When K was deficient small leaves, which suffered from leaf scorch, were produced. The plants having a nutrient soln. deficient in Ca bore leaves larger than those on plants having a complete nutrient soln. Preliminary expts., the Livingston cobalt paper method of measuring transpiration being used, suggested that in dull light transpiration was lower with leaves from trees having a deficiency of K than with leaves from trees of the other 2 series; in bright sunlight the reverse seemed to be true. Some gooseberry plants were grown in the same series; with them K deficiency seemed to cause the leaves to have a lower water content and less ability to resist loss of water. H. G.

The effect of the Franchimont reagent and some other compounds on the calcium oxalate crystals of plants. K. MICZYNSKI. *Bull. Internat. Acad. Polonaise Sci. et Lettres, Cl. Sci. Math. et Nat., Ser. B Sci. Nat.* **1923,** 217–23; *Botan. Abstracts* **15,** 167.—The Franchimont reagent, a satd. aq. soln. of cupric acetate, is usually employed as a test for the presence of resinous material in plant tissues, but it does not always produce a sp. reaction, since not all resinous materials color under its influence, and since many fatty acids react with it. It is shown that the oxalic acid of plant tissues can react with the Cu of this reagent to form cupric oxalate crystals, not in the interior of cells, but in intercellular spaces and tissue rifts. Since these structures form when a bud contg. Ca oxalate is placed in cupric acetate soln., and since the Ca oxalate disappears, M. concludes that they are cupric oxalate (CuC_2O_4). They give reactions characteristic for amorphous cupric oxalate, which are detailed. In lab. expts. pure cryst. Ca oxalate, upon being treated with cupric acetate soln., completely disappeared and cupric oxalate was formed. In the plant tissues the Ca oxalate crystal dissolves and the oxalic acid diffuses into the intercellular spaces where the cupric oxalate crystals

are formed. Patschovsky, in testing for dissolved oxalate in plant tissues, used a soln. of $Fe_2(SO_4)_3$ (5 g. $Fe_2(SO_4)_3$, 20 cc. AcOH, 80 cc. water), obtaining as a result yellow crystals of ferrous oxalate. H. G.

Chemical and mycological investigations concerning species of Rhizopus. YOSITO TAKEDA. *Rept. Dept. Research Inst., Formosa* **1924,** 1-49(Japanese); *Botan. Abstracts* **15,** 332-3.—Pure cultures on rice of *Rhizopus oryzae* Went & Prinsen Geerlings, R. V. Nakazawa, *R. formosensis* Nakazawa, *R. chinensis* var. *rugosporus* Nakazawa, *R. pseudochinensis* Yamazaki, *R. humilis* Yamazaki, and 4 other species were shaken twice daily, held at a temp. of 33° and their behavior was observed. Under these conditions the fungi showed most favorably their activity in the liquefaction and conversion of starch. The development of an aerial mycelium and of sporangia was very slight. The assumption of Nakazawa that *R. oryzae* and *R.* V Nakazawa belong to the same species was confirmed Among the species investigated *R Pêka* I n. sp., which is used in Formosa in the prepn. of an alc. drink "Biityû," is distinguished by a very great capacity to liquefy and convert rice starch. A diagnosis of this species is given and its chem. behavior described at length. There is likewise an extended description of another fungus, *R Pêka* II n. sp. H. G.

Content of ash constituents and nitrogen in leaves of Avena sativa, Trifolium pratense and Phaseolus vulgaris collected at various times of the day. JAN WLODEK *Bull. Internat. Acad. Polonaise Sci. et Lettres, Cl. Sci. Math. et Nat., Ser. B Sci. Nat* **1923,** 65-78; *Botan. Abstracts* **15,** 168.—Expts. were performed in which the influence of time of day on content of ash constituents and N in leaves of beans, oats and clover and the influence of soil nutrition on the possible fluctuation during the day were detd. The amts. of some ash constituents in the leaves showed certain irregularities while those of others were const. The amts. of SiO_2, SO_3 and Na_2O decreased during the night and again increased during the day. With a deficiency of K_2O in the soil, the amt. of Na_2O increased in the leaves during the night. The abs amts of Cl and MgO in the leaves remained const. The amts of protein N in oats were higher at night; in clover the protein in percentage of total N showed a fluctuation which had a different rhythm from that of SiO_2, SO_3 and Na_2O. Also in clover leaves, the non-protein N showed a rather distinct fluctuation every 4 hrs. The amts. of other ash constituents fluctuated more or less irregularly. H. G

Protein of the protoplasm of Myxomycetae. N. N. IVANOV. *Biochem. Z.* **162,** 441-54(1925).—Partial acid hydrolysis of the protoplasm of myxomycetes results in a 16.25% yield of a protein, sol in water and in 80-85% alc. and contg. 16.77% of N This protein is similar in all its properties to that obtained from higher fungi. The total N content of the plastin of myxomycetes of different origin varies from 10 to 12.74% and the P content from 0.32 to 1.34%. Plastin often contains a carbohydrate insol. in water which is hydrolyzable to dextrose by acids and by taka-diastase. The protein content of plastin never exceeds 38.58%. B. C. A.

The role of cane sugar in the plant. R. E. CHAPMAN. *New Phytologist* **24,** 308-9 (1925); *Physiol. Abstracts* **11,** 144, cf. *C. A* **19,** 3291.—C. does not agree with Parkin that the absence of maltose and the presence of sucrose in leaves are evidence that sucrose may be directly synthesized to starch. The absence of maltose in the reactions glucose ⟶ maltose ⟶ starch and starch ⟶ maltose ⟶ glucose can be explained on the assumption of a greater reaction velocity of the last part of the reactions, so that as soon as maltose is formed it is converted into starch or glucose. The better effects of sucrose in starch formation in feeding of detached leaves may be explained on the basis of greater permeability to sucrose. H. R KRAYBILL

Law of photochemical equivalent in photosynthesis by chlorophyll. RENE WURMSER. *J. phys. radium* **7,** 33-44(1926); cf. *C. A.* **19,** 3289.—The reduction of CO_2 by cholorphyll consists of a series of reactions of which the first is photochem. Under low illumination intensities the speed of the process is controlled by the first photochem. process. If one measures the quantity of gas reduced by the luminous energy absorbed by chlorophyll in different regions of the spectrum one is able to investigate the action of the rays in accordance with the law of photochem. equivs. W. finds that the ratio of the no. of mols. of CO_2 reduced to the luminous energy absorbed is not inversely proportional to the frequency and concludes that the law of photochem. equivs. does not apply to the primary reaction of photosynthesis. H. R. KRAYBILL

The role of glucosides in plants. MARC BRIDEL. *Rev. gen. sci.* **37,** 134-9(1926).—A general discussion with a brief bibliography. H. R. KRAYBILL

The fatty substances of the plant growing point. EDGAR RHODES AND R. M. WOODMAN. *Proc. Leeds Phil. Lit. Soc.* **1,** 27-36(1926).—A study is made of the fat-forming power at the apex of shoot and root of *Vicia faba* L. and *Pisum sativum* L.

Unsatd. fats are prevalent in ungerminated seeds. Fatty material is produced and the supply maintained by the activity of the stem and root meristems; this originally unsatd. material moves outward during growth and becomes satd. Such satd. fats are found in stem and roots. Bean root tips, grown in sterile culture media and analyzed for fat content not only form cellulose, but synthesize protein and release fatty substances. Normal and hydroxy fatty acids increase in amt. in the root tip under culture. N. M. Naylor

Algae containing free iodine. C. Sauvageau. *Rev. bot. app. agr. col.* **6,** 169–70 (1926); *Chimie et industrie* **16,** 209(1926).—S. has discovered the presence of I in the young cells of certain southern algae which have been found on the coasts of Europe (Gulf of Gascony) only within a few yrs, particularly *Asparagopsis armata, Falkenbergia doubleti* and *Bonnemaisonia asparagoides.* They contain free I in the vacuoles inside the cells, and also combined I which varies in amt. with the age of the plant. S. suggests that they would be suitable for com. and therapeutic uses. A. P.-C.

Action of radium on Aspergillus fumicatus Fresenius in dissociated and undissociated media. A. Sartory, R. Sartory and J. Meyer. *Compt. rend.* **183,** 77–9 (1926).—Four media were used, *viz.,* glucose and sucrose in the presence and in the absence of NaCl. The cultures of *A. fumicatus* were subjected (I) to discontinuous Ra irradiations by 8 treatments during 15 days in doses increasing from 150 to 2400 microcuries, or a total of 7.2 millicuries. Twelve hrs. after each irradiation the cultures were examd. with the microscope and changes noted. (II) The cultures were subjected to continuous irradiation for 24 hrs. with a total of 7.2 millicuries. On dissocd. media the effect of irradiation (I) was to promote the formation and increase the size of the reproductive parts. The effect of irradiation (II) was similar but less pronounced On nondissocd. media irradiation (I) retarded the growth of the reproductive part and modified the form of the mycelial filaments. Irradiation (II) gave similar but less pronounced results. L. W. Riggs

A new glucoside, hydrolyzable by rhamnodiastase, extracted from fresh flowers of Ulex europaeus L. M. Bridel and C. Béguin. *Compt. rend.* **183,** 75–7(1926).—The biochem. method of the study of glucosides hydrolyzable by rhamnodiastase (cf. *C. A.* **20,** 1428) yields a substance (100 cc. equiv. 100 g fresh flowers) which has a rotation of $-0°\ 48'$ and 2.198 g. of reducing sugar. After the action of invertin the figures are $-1°\ 10'$ and 2.613 g., and after the action of rhamnodiastase $-0°\ 50'$ and 2.728 g. The glucoside, for which the name *ulexoside* is proposed, is extd from the flowers by boiling alc., the alc. is distd. off, and the residue is extd. with ether to remove fatty substances. The aq. residue is concd. under reduced pressure and on standing yields crystals of ulexoside. The purified crystals lose 4.46% of their wt. at 50°, α_D $-51.92°$ for the product crystg. from 70% alc, and dissolved in 70% alc., m. 247°, and heated with H_2SO_4 it gives the odor of methylfurfural. Ulexoside is hydrolyzed by rhamnodiastase when a ppt. forms, the liquid sepd. from the ppt becomes optically inactive and contains 16.65% of reducing sugar calcd as glucose to the original ulexoside. The ppt., when dried at 105° and treated with boiling 95% alc. to remove the rhamnodiastase, yields on cooling a hydrated cryst. product for which the name *ulexogenol* is proposed. When dried in a vacuum over H_2SO_4, ulexogenol appears as a creamy white cryst. powder, m. 261°, insol. in water, sol. in dil. NaOH, the soln. passing through the colors yellow, red and green. L. W. Riggs

Soluble enzymes secreted by the fungi of the class Hymenomycetes. Oxidizing actions. L. Lutz *Compt. rend.* **183,** 95–7(1926).—Mycelium of various species of mushrooms was grown on nutritive media contg. substances of which the oxidation is manifest by a color reaction in the presence of 0.01% guaiacol and 0.005% naphthol. In general the enzymes of mushrooms have a strong oxidizing action (cf. following abstr.). L. W. Riggs

Soluble enzymes secreted by fungi of the class Hymenomycetes. Reducing actions. L. Lutz. *Compt. rend.* **183,** 246–7(1926); cf. preceding abstr.—Mycelium of 10 species was cultivated in a gelose medium contg. 1 drop per 5 cc. of a 0.125% soln. of methylene blue. Some of the tubes were exposed to free air, some to air at a pressure of about 20 cm. Hg, and some after growing a week in free air were placed in an atm. of CO_2. In general the methylene blue was decolorized, some of the cultures passing through the intermediate colors of lilac or green. These changes are more rapid in CO_2 or rarefied air than in free air, and are attributed to the reducing action of the enzymes secreted by the fungi. In the case of *Polyporus pinicola* the decoloration was followed by a progressive recoloration, and this by a second decoloration and recoloration. L. W. Riggs

Apple physiology, growth, composition and fruiting responses in apple trees.

R H. ROBERTS. Wisconsin Agr. Expt. Sta., *Research Bull.* **68,** 72 pp.(1926).—Over-vegetative and under-vegetative trees having a high N and low carbohydrate content were unfruitful. Blossom bud formation accompanied a condition of moderate growth and of balance between the N and carbohydrate content. Numerical ratios between different compds. such as starch and total N are not feasible at present. Fruitfulness of the different branches of a tree depends upon their particular growth and compn.; *e. g*, the formation of blossom buds seems to be very closely related to secondary thickening. Apple trees may accumulate and use N reserve. The carbohydrate reserve occurs principally as wall thickenings. A macrochem. study of this material is rendered difficult by what appear to be inadequate methods of hydrolysis. Better chem. methods are needed for studying the carbohydrate reserves, especially the pentose fractions. Acidity and oxidase tests show bigger differences in the tissues of a sample than between different samples. Limited catalase tests indicated a lack of direct correlation between this reaction and blossoming bud formation. Micro-chem. analyses gave results closely paralleling the microanalyses, although not always of the same order. N very probably has other effects upon the non-accumulation of carbohydrates than alone upon their utilization in increased growth. The set of fruit is inversely proportional to the % of spurs blossoming under like nutritional conditions. The color of the fruit varies inversely with the N content. To consider fruitfulness as the result of a balanced condition in growth and in plant compn. offers a basis for interpretation of the present conflicting reports as to the result of cultural expts. A bibliography of 96 references is appended. J. J. S.

A preliminary examination of four northwestern plants. E. V. LYNN AND P. Y. CHENG *J Am. Pharm. Assoc.* **15,** 105 8(1926) --Four plants native to Washington were studied. They were *Lysichiton camtshatcene* (skunk cabbage), *Asarum caudatum* (wild ginger), *Gaultheria shallon* (salal) and *Micromeria douglassi* (tea vine). The loss on air drying, loss at 100°, benzene ext , Et_2O ext., EtOH ext., H_2O ext., and volatile oil (if any) were detd for each plant Contrary to expectations skunk cabbage and salal contained no volatile oil. Glucosides were absent from all 4 plants, but there were possibilities that traces of alkaloids might be present in 3. Wild ginger yielded a small amt of volatile oil n_D^{22} 1 5195, it solidified at 4° to 5°. The work is being continued. L. E. WARREN

The method of formation and the role of alkaloids in plants. MICHEL POLONOVSKI. *Bull. soc. chim.* **35,** 1365–98(1926).—A good historical review of the formation of alkaloids in plants is given in considerable detail with the elaboration of chem. reactions showing the possible chem steps taken, but it is emphasized that the elaboration of these alkaloids in the plant does not proceed by successive steps as done by lab synthesis, but is performed according to a type peculiar to each species Four hypotheses are given as to the role of alkaloids in plants which is concerned with the development and preservation of the plant, namely: (1) role of protection, (2) reserve food material, (3) method for the elimination of waste, and since some alkaloids excite and regulate some functions of the plant, they may play the (4) role of vegetable hormones. J. J. WILLAMAN

Carbon assimilation by plants. J. C. BOSE. *Scientia* **40,** 143-52(1926).—Infinitesimal traces of chem. substances produce an extraordinary increase in the power of assimilation. HCHO, which in large doses acts as a poison, is found in a soln. of 1 part in a billion to produce an increase of activity of 80%. This stimulating effect of HCHO is especially significant as related to the first product of photosynthesis since it is thought that the initial product is HCHO. The photosynthetic curves for increasing supply of CO_2 or of malic acid are found to be very similar, showing that the org. acid in the plant serves as a substitute for external supply of CO_2. Then, in an acid condition the adsorption of CO_2 is less than in normal plants, and the assimilatory quotient O_2/CO_2 is greater than unity. The respiratory quotient CO_2/O_2 is then less than unity and in extreme cases may be zero. The photosynthetic efficiency is affected by intermittent light. The characteristic effects in different regions of the spectrum are due (1) to the energy of the rays, (2) to their absorption and (3) to the complementary A and D reactions in the production of photosynthesis and of phototropic movement. The efficiency of the photosynthetic organ is found to be about 7.4% in the *Hydrilla* plant. In photosynthesis, if increase of activity by change of CO_2 concn. from c to C be X times, by change of intensity of light from l to L be Y times, by change of temp. t to T be Z times, then the resultant variation of activity from clt to CLT will be XYZ. This law of combined effects of different factors in photosynthesis is expressed by the formula A/CLT is const. J. J. WILLAMAN

Effect of thickness of seeding on flax (STROEBEL) 25. Thickness of seeding and stem diameter of flax (MÜLLER) 25.

E—NUTRITION

PHILIP B. HAWK

The photoactivity of cod-liver oil. F. W. SCHLUTZ AND M. MORSE. *Proc. Soc. Exptl. Biol. Med.* **22,** 555–6(1925).—A slow stream of dry O_2 was continuously passed over the surface of cod-liver oil of known vitamin activity made alk. with 10% KOH. Eastman's Speedway dry plates were exposed in the dark to this oil for 66 hrs. without affecting the plates. The results are not in accord with the findings of Kugelmass and McQuarrie C. V. B.

Influence of nutritive condition on initial fall in blood sugar after insulin. M. TIITSO. *Proc. Soc. Exptl. Biol. Med.* **23,** 40–3(1925).—Rabbits starved for 1 to 2 weeks were more resistant to the influence of insulin than controls which were well fed with carrots. C. V. B.

Studies of the nutrition of young animals. I. Energy exchanges in the growing pig. T. B. WOOD. *J. Agr. Sci.* **16,** 425–42(1926).—Exptl. data on the basal metabolism, caloric value of live wt. increase and maintenance requirements of the Large White breed of pigs are presented. With the aid of charts based on these data a series of rations can be computed for this breed which, from the energy point of view, will produce any desired rate of live wt. increase within the capacity of the animals. The initial age and live wt. must be known. P. R. DAWSON

Growth factors. VIII. HANS V. EULER AND MARGARETA RYDBOM. *Z. physiol. Chem* **155,** 270–8(1926); cf. *C. A.* **20,** 3024.—A basal ration to which the vitamins A and hD were supplied in the form of "marmite" and C as lemon juice was fed to white rats and supplemented by boiled and filtered yeast ext., purified cozymase, muscle ext. and meat, resp. In proportion to their cozymase content the purified prepn. gave a greater growth response than the crude yeast prepn Cozymase is present also in muscle but to a much smaller extent than in yeast. The same amt. of muscle ext. was insufficient to give a perceptible growth effect It is possible, however, that the yeast contains an additional growth-promoting substance which is absent from the muscle ext. On a ration to which cod-liver oil supplied insufficient A and 1D for growth, the rats gained at the normal rate when 0.5 g. of meat was fed daily for 14 days. Although 5 min boiling of the meat with H_2O did not diminish this effect, extn. with 10 vols of H_2O at 100° diminished it considerably. A distinct increase in wt. was also noted in 12–28 days after daily addns. of 0.5 g. meat to an A-free ration. It might be concluded from these expts that a water-sol factor can here replace the fat-sol. 1D. However, it must be remembered that A and 1D exhibit a certain distribution between the 2 solvents fat and H_2O. Again, it is possible that with const. wt. or even slight loss in wt. the animal does not lose its entire A and 1D reserve. The fact that yeast ext is more potent than marmite suggests that the latter has lost an active yeast constituent during its prepn. Cozymase is destroyed by the same treatment, so that marmite can contain only minimal amts. of cozymase. The tentative conclusion is drawn that yeast ext. and meat contain an additional *growth factor F,* which is distinct from hD and 1D. There is some evidence that the source of A and 1D is not limited to the food intake, and that these may be synthesized in the animal organism, though to varying extents in different species and different individuals. The synthesis is believed to occur in 2 steps: (1) synthesis of a basal sterol substance, and (2) activation of this, usually but not necessarily, by ultra-violet rays. A. W. DOX

The importance of the vitamin content of foods in nutritional and developmental disorders of childhood. LOTTE LANDÉ. *Deut. med. Wochschr.* **52,** 1388–90(1925).—A review. ARTHUR GROLLMAN

The dependence of the toxicity of calcium on the diet. LOTTE KOOPMANN. *Deut. med. Wochschr.* **52,** 1467–9(1926).—The toxicity of Ca salts intravenously injected into mice was found to depend in part on the Na and K content of their diet. A. G.

The question of metabolic changes during radiation. R. FLICKINGER. *Deut. med. Wochschr.* **52,** 1501–2(1926).—Guinea pigs subjected for several hrs. to sunlight show no changes in the *residual N* values of their livers. The view that sunlight at high altitudes influences metabolic processes is therefore discountenanced. A. G.

The relation of the rate of growth to diet. I. T. B. OSBORNE AND L. B. MENDEL. *J. Biol. Chem.* **69,** 661–73(1926).—Growth curves of rats maintained on different diets are given and discussed. ARTHUR GROLLMAN

Preferential utilization of carbohydrates in diabetes. W. R. CAMPBELL AND

J. Markowitz. *J. Clin. Investigation* (*Proc.*) **2,** 608(1926).—No preferential utilization of levulose, insulin, glycerol or dihydroxyacetone occurred in depancreatized dogs.
Arthur Grollman

Metabolism during fasting in the human subject. Wm. G. Lennox. *J. Clin. Investigation* (*Proc*) **2,** 609(1926).—Daily measurements of O consumption, N excretion and HCO_3^-, sugar and non-protein N of the blood were made during 5 fasting periods of 6 to 15 days. The O consumed increased during fasting and ran parallel to the N excretion.
Arthur Grollman

The role of insulin in protein metabolism. N. W. Janney and I. Shapiro. *Arch. Internal Med.* **38,** 96–108(1926).—In 6 fasting persons receiving glucose and glucose-insulin the additional fall in N output due to insulin represented 9.93–13.79% of the N output under glucose alone. There was also a drop in blood N, 18.3% in urea N, 4% for non-protein N, which, however, may be a result of the increased blood vol. After a lengthy discussion of the literature the following conclusion is reached: "The seat of activity of insulin is in the protein tissues. Protein sparing by carbohydrate is increased by insulin. Diabetes may be a result of deficient protein metabolism." Insulin-carbohydrate therapy is recommended for various non-diabetic conditions associated with protoplasm strain or destruction, such as inanition, trauma, sepsis.
Mary Jacobsen

Diet and reproduction. II. G. Grijns and K. de Haan. *Verslag Akad. Wetenschappen Amsterdam* **35,** 485–9(1926); cf. *C. A.* **20,** 1096, 3024.—Rats fed on a diet deficient in vitamin E showed normal growth and reproduction but the females of either the 1st or the 2nd generation were unable to suckle the young. There are at least 2 reproductive vitamins, one of which affects lactation only. M. J.

Further evidence that small quantities of copper, manganese and zinc are factors in the metabolism of animals. J. S McHargue. *Am. J. Physiol.* **77,** 245–55(1926).—The growth, condition and composition of rats reared on synthetic diets with and without the addition of salts of Cu, Mn and Zn, singly and in mixts indicated that compds. of Mn more definitely and possibly Cu and Zn also have important biological functions in animal metabolism.
J. F. Lyman

The physiology of vitamins. IV. Vitamin B in relation to gastric motility. G. R. Cowgill, H. J. Deuel, Jr., N. Plummer and F. C. Messer. *Am. J. Physiol.* **77,** 389–401(1926); cf *C. A.* **19,** 3520.—Tests with dogs having gastric fistulas, using the inflated rubber balloon method for measuring gastric motility, showed that in animals exhibiting severe symptoms of vitamin B deficiency gastric atony prevailed. Successful vitamin B therapy in these cases resulted in a rapid improvement in tone of the stomach musculature.
J. F. Lyman

Biological food tests. IX. Vitamin A in three varieties of cheese. Agnes F. Morgan. *Am. J. Physiol.* **78,** 11–6(1926).—Swiss cheese had a lower vitamin A content than was indicated by its butter fat content; cream cheese (Cheddar) and Limburger showed greater vitamin A values than would be carried in an amt. of butter equal to the fat present.
J. F. Lyman

Metabolism. IV. The basal metabolic rate of normal dogs. Margarete M. Kunde and A. H Steinhaus. *Am. J. Physiol.* **78,** 127–35(1926).—Basal metabolic rates are reported for 13 dogs. Averaging the results with those of Lusk and Dubois, with which they agree closely, an av. basal metabolism of 771.2 Cals. per sq. m. per 24 hrs. was obtained.
J. F. Lyman

The effect of soy bean feeding on the blood lipase of rabbits. A. A. Horvath and H. C. Chang. *Am. J. Physiol.* **78,** 224–34(1926).—Feeding rabbits raw soy beans had a tendency to increase the lipase of the blood serum (rate of hydrolysis of ethyl butyrate used as test for lipase), and to cause necrosis of the fatty tissues. J. F. L.

Calcification in rabbits. May Mellanby and Esther M. Killick. Proc. Physiol. Soc., *J. Physiol.* **61,** xxiii(1926).—Rabbits fed oats (4 parts), bran (1 part) and 6 cc of lemon juice daily grew slowly and showed some signs of rickets. When 1.5% $CaCO_3$ was added growth was much improved, life prolonged and bad rickets and defective teeth usually resulted. Grass in spring and summer seemed to contain both vitamins C and D, while in late summer and winter neither C nor D was present in some cases. Cabbage improved health when used as a supplement to oats, bran and $CaCO_3$, but did not prevent severe rickets and defective teeth. On boiled cabbage rickets developed earlier than on raw cabbage; cabbage radiated with ultra-violet prevented or delayed rickets. White cabbage, white turnips and potato were without benefit to the calcification process; dandelion leaves, carrots and swede turnip had some beneficial effect. Egg yolk, cod-liver oil and treatment of the animals by ultra-violet radiation prevented defective calcification.
J. F. Lyman

The presence in foodstuffs of substances having specific harmful effects under certain conditions. E. MELLANBY. Proc. Physiol. Soc., *J. Physiol.* **61**, xxiv(1926).—Cereals seem to contain a substance that interferes with calcification of bones. This substance is destroyed (1) by boiling with 1% HCl and neutralizing with NaOH, (2) by germination followed by heating at 100° for 18 hours Wheat germ contains a toxin which produces nervous symptoms. The action of this toxin is prevented by butter and cod-liver oil, and reduced in intensity by $CaCO_3$ in the diet. Boiling 1 hr. in 1% HCl also reduces the symptoms. Toxic substances of this type found in foods are called "*Toxamins*" by M. J. F. LYMAN

The relative utilization of feed energy for maintenance, body increase and milk production of cattle. E. B. FORBES, J. AUGUST FRIES, WINFRED W. BRAMAN AND MAX KRISS. *J. Agr. Research* **33**, 483–92(1926) —In a series of respiration calorimeter studies of the energy metabolism of cows, both in dry condition and in lactation, and on different planes of nutrition, the av. rates of utilization of the net energy of the ration for maintenance, lactation and body increase were found to be as 1 for maintenance, 0.985 for lactation and 0.761 for body increase. With a lactating female the rates of efficiency of utilization of food for the maintenance of the life of the mother and for the production of milk for the offspring are thus apparenty alike, while the economy of use for body growth is at a distinctly lower rate. W. H. ROSS

Selection of cod-liver oils for medicinal use. E. POULSSON. *Lancet* **1926, I,** 320–1.—P. disagrees with Drummond and claims that Newfoundland and Norwegian cod-liver oils are, on the av , equally potent as to vitamin content. He also claims that Lofoten oils have a high vitamin content, contrary to Drummond. No difference in vitamin content was found in oils secured during the spawning season or at other times. F B. SEIBERT

Nutrition and cell functions. IV. EMIL ABDERHALDEN AND ERNST WERTHEIMER. *Arch. ges. Physiol.* (Pfluger's) **213**, 321–7(1926); cf. *C. A.* **20**, 437.—Rabbits fed on acid diets show a better healing after fracture of the bones than do rabbits kept on an alk. diet. Rabbits on an alk diet react to exposure to the Hg vapor lamp with a fall in inorg and org serum P, while those on an acid diet, similarly exposed, show either no change or an increase in the P of the serum. G. H. S.

Nutrition and the effect of internal secretions. VI. Effects of thyroxin in conjunction with different diets. EMIL ABDERHALDEN AND ERNST WERTHEIMER. *Arch. ges Physiol.* (Pflüger's) **213**, 328–35(1926).—The type of diet definitely influences the effect of thyroxin on metabolism. Thus, rats on a carbohydrate-rich protein-poor diet show a relatively slight increase in gas metabolism. After a dose of 0.3 mg. of thyroxin the av increase is 14 1%, and the av. duration is not over 3 days. Upon a meat diet there is a very marked increase (37.3%) in gas metabolism, lasting for a longer period ($9^1/_3$ days) and then it gradually falls. On a fat diet the effect of thyroxin is intermediate; the max. increase is 24.5%, the duration 6 days. The products of protein metabolism must be of great importance in regulating the action of the thyroid glands. G. H. S.

E—PHYSIOLOGY

E. K. MARSHALL, JR.

A thyroid-adrenal interrelationship. R. L. ZWEMER. *Proc Soc. Exptl. Biol. Med.* **23**, 31–2(1925).—Thyroidectomized cats survived total adrenalectomy much longer than animals retaining their thyroids. The administration of thyroid ext. hastened the death of adrenalectomized animals C. V. B.

The effect of breathing oxygen-enriched air upon the excretion of lactic acid. A. W. HEWLETT, G. D. BARNETT AND J. K. LEWIS. *Proc. Soc. Exptl. Biol. Med.* **22**, 538–9(1925).—Lactic acid was detd. in the urine of 2 subjects before and after a measured exercise. In a second group of expts. the subjects breathed air contg. 40% O_2. The excretion of excess lactic acid was greatly decreased when O_2-enriched air was breathed. C. V. B.

The effect of training on lactic acid excretion. J. K. LEWIS, A. W. HEWLETT AND G. D. BARNETT. *Proc. Soc. Exptl. Biol. Med.* **22**, 537–8(1925).—An untrained subject began a regular definite exercise, at first twice a week and then daily. Urine was collected before and half an hour after the exercise. The excess of lactic acid in the 2nd sample was attributed to the exercise. As the expt. progressed the excess of lactic acid decreased, and this was associated with less distress during the exercise and less fatigue afterwards. C. V. B.

The influence of acidity in the intestine upon the absorption of calcium salts by

the blood. L. Irving and J. Ferguson. *Proc. Soc. Exptl. Biol. Med.* **22**, 527–30 (1925).—Under urethan anesthesia, the intestines of dogs were injected with solns. of $CaCl_2$ buffered at p_H 3 0 and 8 0 respectively. Absorption of Ca into the blood was much more rapid and pronounced from the acid medium. The reason for this is not clear. C. V. B.

Relation between carbohydrate metabolism and inorganic phosphorus. Gaetano Piazza. *Arch. farm. sper.* **41**, 85–91(1926).—No quant. relationship could be demonstrated between insulin hypoglucemia and hypophosphatemia. The 2 phenomena are entirely independent although due to the same cause. There is no appreciable increase in P excretion in the urine during muscular fatigue. The work performed, and hence the glucose consumed, bears no relation therefore to the excretion of urinary P. A. W. Dox

Excretion of fat in the urine. Ernst Faerber. *Z. physiol. Chem.* **154**, 302–9 (1926).—The urine of healthy children in contrast to that of adults is entirely free from fat. With dogs a distinct fat excretion can occur even under physiol. conditions. Ligature of the thoracic duct resulted in the typical phenomena of pyuria. A. W. D.

Summit metabolism and metabolic quotient. I Giaja. *Ann. physiol. physicochim. biol.* **1**, 596–627(1925), *Physiol. Abstracts* **11**, 120.—Summit metabolism is described as the max expenditure of energy when exhaustive calls are made upon the reserves of thermogenesis in combat with cold. $\frac{\text{Summit metabolism}}{\text{Basal metabolism}}$ = metabolic quotient, which expresses the power of accommodation of thermogenesis. The value of these characteristics present great discrepancies in relation to the law of surface By taking the formula for surface S in function of weight P, $S = K\sqrt[3]{P^{2}}$ K varies for different animals of the same species and for the same animal according to age H. G.

Metabolic quotient in the embryo and in growth. I. Giaja. *Ann. physiol. physicochim. biol.* **1**, 628–34(1925), *Physiol Abstracts* **11**, 120 1.—The chick, prior to rupture of the shell in which it has been hatched, has no thermo-regulatory mechanism, but after rupture of the shell can maintain combustion at the same level even with a drop of 10° in the temp. of the surroundings. After a few days the metabolic quotient attains a value which does not undergo further change. The rabbit 12 hrs. after birth possesses a metabolic quotient of 1·3 $\left(\frac{\text{summit metabolism}}{\text{basal metabolism}}\right)$. It increases during 6 days, and then ceases to increase H. G.

Respiratory quotient of resting muscles. H. E. Himwich and W. B. Castle. *Am. J. Physiol.* **76**, 188(1926) —The respiratory quotient, detd. from the blood of resting muscle *in situ* with its blood supply intact, was close to that of the whole animal and was less than unity. Resting muscles do not oxidize carbohydrate exclusively. B C. A.

A study on the contracting and dilating apparatus of the pulmonary blood vessels. Kimiyuki Hirakawa. *Acta Scholae Medicinalis* **7**, IV, 467–79(1925).—On comparing the effect of adrenaline, pituitrin, peptone and human serum on the perfused pulmonary blood vessels of the isolated lung of white rats, with their effect on the blood vessels of the hind legs, it was found that the former suffered no great contraction, whereas a strong contraction was observed in the vessels of the legs. Solns of amyl nitrite, caffeine Na benzoate, and strychnine behaved in a similar manner. No remarkable contraction is caused in the pulmonary vessels by emetine, tartar-emetic, $CuSO_4$, or apomorphine. Thus the pulmonary vessels of the white rat have no remarkable app. for contraction or dilation as is observed in the vessels of the hind legs. W. F. G.

The site of ammonia formation and the role of vomiting in ammonia elimination. S. R. Benedict and T. P. Nash, Jr. *J. Biol. Chem.* **69**, 381–96(1926).—A criticism of the conclusions of Bliss (*C. A.* **20**, 2358). The increased NH_3 content observed by Bliss in the *pancreaticoduodenal* and *splenic* veins is attributed to absorption from the intestinal tract. The feces of fasting dogs are shown to contain several times more NH_3 than the total urinary output and the source of the NH_3 in vomitus is, therefore, considered as the digestive tract rather than the blood. Arthur Grollman

The specific function of the ovary in the female and the prospects for organotherapeutic use of ovarian preparations. Albrecht Heyn *Deut. med. Wochschr.* **52**, 1333–6(1926).—A review. The heretofore-described ovarian prepns. are considered to be of little or no value. Arthur Grollman

The female sexual hormone; the hormone of the estrual cycle (menformone). IV. Effect on metabolism; its resistance against physical or other influences. Ernst Laqueur, P. C. Hart and S. E. de Jongh. *Deut. med. Wochschr.* **52**, 1331–3(1926); cf.

C. A. **20**, 2530.—Injection of menformone into ovariectomized rats increases their metabolism. The ovarian hormone is sol. in H_2O and dialyzable. The active principle partly disappears on dialysis. It is adsorbed by charcoal and filter paper. It resists temps. as high as 360°. It is highly resistant to the action of acids, alkalies, reduction and pancreatic or peptic digestion. It is easily affected by oxidizing agents. A. G.

Studies concerning the origin of urinary ammonia. III. I. M. RABINOWITCH. *J. Biol. Chem.* **69**, 283–8(1926); cf. *C. A.* **18**, 859 (I); 1325 (II).—The NH_3 content of the blood and urine of 15 diabetics was detd. An attempt was also made to det. the total circulation rate of the blood from simultaneous detns. of the O contents of arterial and venous blood (from the arm) and the O consumption of the body. The blood NH_3 values were within the normal limits of variation. In 5 cases, the NH_3 excreted was greater in amt than could be accounted for by the total NH_3 brought to the kidneys. In other cases an impossible fraction of the total blood would have had to pass through the kidneys to account for the NH_3 eliminated. The view is, therefore, advanced that the kidneys are the site of formation of the greatest part of the NH_3 excreted in the urine. ARTHUR GROLLMAN

Blood-sugar time curves. I. M. RABINOWITCH. *J. Clin. Investigation* **2**, 579–86 (1926).—A number of blood-sugar time curves were obtained on individuals having a max blood sugar above 0.18% following ingestion of glucose, whose blood sugar returns to the normal level after 3 hrs. By correlating these curves with the clinical pictures it was found that in the majority of cases this condition was associated with disturbances in carbohydrate metabolism. ARTHUR GROLLMAN

Elasticity of connective tissue in healthy individuals at different ages. C. HÄBLER AND J. POTT. *Klin Wochschr.* **5**, 1317–9(1926).—Connective tissue is highly elastic at all ages The elastic resistance, *i. e.*, the resistance offered by the tissue to a given force, increases with age. This indicates that the elastic tissue increases in density with age MILTON HANKE

Glucolysis and blood coagulation. B. STUBER AND K. LANG. *Klin. Wochschr.* **5**, 1471–2(1926).—Substances that retard glucolysis also retard the coagulation of the blood. Blood coagulation is associated with an absorption of O and a conversion of glucose into lactic acid and CO_2. This glucolysis also occurs in plasma. Substances that prevent coagulation also prevent glucolysis. Plasma in which coagulation has been prevented by the addn of citrate or oxalate (and which shows no glucolysis) gives normal glucolysis values when it is treated with a Ca salt. MILTON HANKE

The occurrence of hematin in blood serum in man and in animals. K. BINGOLD. *Klin. Wochschr.* **5**, 1550–2(1926).—Although hemoglobin is being constantly destroyed in the mammalian organism, bilirubin is the only intermediary product that can normally be detd. Hematinemia has been proved to occur only in malaria, gas bacillus infections and at certain periods in pernicious anemia. Hematinemia can be produced in dogs, guinea pigs and rats (not in rabbits) by administering toluylenediamine or phenylhydrazine. These amines produce a profound anemia. Hematinemia occurs only at the time of active poisoning and disappears while the other symptoms of intoxication are still unabated. MILTON HANKE

Studies on the permeability of the meninges with special reference to physicochemical points of view. A. WITTGENSTEIN AND H. A. KREBS. *Z. ges. exptl Med.* **49**, 553–622(1926); cf. *C. A.* **20**, 3018.—A great no. of diffusible anions, representing types of chemically different substances, were tested for their ability to pass from the blood to the cerebrospinal fluid. They all passed, if present in the blood for a sufficient length of time and in sufficient concn. With the exception of the inorg. cations normally present in the body, diffusible cations do not pass into the cerebrospinal fluid after a single intravenous injection. This is due to their adsorption by cells, which takes them from the blood stream. They may exert a toxic action on the cells but do not accumulate in the blood in sufficient amt. to pass into the liquor. The anions, on the other hand, are poorly adsorbed and tend to accumulate in the fluids contg. the least amt. of absorbents, *i. e.*, the least amt. of protein, such as blood plasma and liquor. In the healthy organism there is an impermeability of the meninges for colloids. There are, however, grades between a crystalloid anion which passes the meninges readily and a colloid protein which cannot pass. A "semi-colloid" such as trypan blue generally is held back by the choroid plexus but if present in sufficient concn. might pass. The permeability of the meninges acts on the principle of an ultra-filter holding back colloids and letting crystalloids through. The permeability of the meninges for anions is a function of their degree of dispersion. HARRIET F. HOLMES

The physicochemical basis of the mastic reaction. K. SAMSON. *Z. ges. exptl.*

Med. **49**, 95–109(1926).—Mastic in colloidal soln. is a true suspension and the particles carry a negative charge. The difference in potential that keeps the particles in suspension is altered by the addn. of acids, bases or salts. The salting out of mastic is dependent on the H-ion concn. Where mastic is mixed with serum or globulin the mastic particles become coated with the protein or globulin and are salted out in the same manner as serum or globulin alone, that is, the greater the concn. of $(NH_4)_2SO_4$ the greater the pptn. If the protein is insufficient to coat all the mastic particles, both mastic-salt pptn and mastic-protein pptn. take place. Mastic-albumin mixts. behave like an amphoteric suspension. It is probable the albumin becomes denatured at the surface of the mastic particles. Mastic-cerebrospinal fluid mixts. behave similarly which perhaps is an indication of an albumin-like substance in the cerebrospinal fluid which becomes denatured at the surface of the mastic particles. H. F. H.

Heart hormone. L. HABERLANDT. *Klin. Wochschr.* **5**, 1522(1926); cf. *C. A.* **19**, 2522; **20**, 213.—Alc. exts. of the heart contain a heart stimulant that gradually loses in strength if the soln. is stored but is still quite active after 25 days. The active substance is insol in ether and difficultly sol. in $CHCl_3$; hence it is not a lipoid. It is dialyzable and thermostable. MILTON HANKE

Is there a possibility of the occurrence of a tetanic contraction of the musculature of the heart and stomach, by alterations in the concentration of ions? H. ZIMMER. *Z. ges. exptl. Med* **49**, 471–9(1926).—No tetanus could be caused in frog heart muscle by change of the K and Ca concn of the Ringer soln. In 0.3 and 0.4% $MgCl_2$-Ringer soln. a tetanus-like condition was obtained twice Expts. with frog stomach prepns were negative in result. HARRIET F. HOLMES

The question of phosphorus retention in cats deprived of their parathyroids. H. POPPER. *Z. ges. exptl Med* **49**, 547–52(1926).—Neither the P, nor the Ca content of organs (muscle, liver) is markedly altered in cats by removal of the thyroid and parathyroids. There is no evidence of an alteration of the Ca/P ratio in the soft parts of the body. HARRIET F. HOLMES

The nature and place of urea excretion in the kidney. N MELCZER. *Z. ges exptl. Med.* **49**, 678–87(1926)—On account of its ready soly in H_2O, C_2H_5OH and many other commonly used reagents for histological technic, it is not easy to demonstrate how urea is excreted. By injection of $Hg(NO_3)_2$ and subsequent fixation of the tissues in $HgCl_2$ an insol. compd is formed which is found in the cells of the convoluted tubules and the ascending portion of the loop of Henle, but not in the cells of the descending portion of the loop or in the collecting tubules or in the lumen of Bowman's capsule The picture is much more distinct after the subcutaneous or intraperitoneal injection of urea. However, the slight diuresis caused by the intravenous injection of urea in H_2O is sufficient to cause urea to pass through the glomeruli, while the cells of the collecting tubules show abundant vacuolization. HARRIET F. HOLMES

Insensible perspiration. Its relation to human physiology and pathology. F. G. BENEDICT AND H. F. ROOT. *Arch. Internal Med.* **38**, 1–35(1926).—If the hourly insensible perspiration or the loss caused by the emanation of CO_2 and water from the lungs and skin is plotted against the 24-hr. heat production a straight-line curve indicates the general trend of *basal metabolism* in normal, thyroid and diabetic patients. Values of 14–58 g./hr (detd. by means of a sensitive balance) corresponded with a heat production of 900–2275 cal. daily. MARY JACOBSEN

Water metabolism. IV. Sugar metabolism in dehydration. EDMUND ANDREWS. *Arch. Internal Med.* **38**, 136–41(1926); cf. *C. A.* **20**, 1837.—"The intensity and duration of the fall of blood sugar after administration of insulin are enormously greater in animals which are dehydrated by various means and much less in animals which are flooded with water." MARY JACOBSEN

Clinical physiology of the stomach. Simultaneous quantitative observations on gastric secretory volume, acidity and motility. A. L. BLOOMFIELD AND C. S. KEEFER. *Arch. Internal Med.* **38**, 145–57(1926).—Persons without gastric symptoms secreted from 9 to 69 cc./10 min. gastric juice following stimulation with alc.; in 73% cases the secretion was 10–30 cc. The titratable acidity varied from 0 to 118 and showed no relation to the vol. secreted. The motility varied widely and independently of either acidity or vol. For the same individual acidity and vol. were practically const. at different times; the motility varied greatly. MARY JACOBSEN

Influence of homologous alcohols upon the formation of sugar by frog liver. III. E. J. LESSER. *Biochem. Z.* **171**, 83–8(1926); cf. *C. A.* **19**, 2694.—The livers of winter frogs (Feb.) which contain 10–20% of glycogen, when perfused with Barkan-Hahn-Broemser soln. contg 5% of PrOH, yield reducing sugars to 3 times their normal amt.

After 3–4 hrs. the sugar again comes to its normal value of about 120 mg. per 100 g. liver. W. D. L.

Effect of the ingestion of sugar upon the respiration of liver cells. G. v. MARTOS AND B. SCHNEIDER. *Biochem. Z.* **169,** 494–7(1926).—Glucose is injected into guinea pigs. After intervals they are killed, the livers mashed, and the respiration of the mash, as indicated by the reduction of nitroanthraquinone, is observed. The ingestion of sugar causes an increase in the oxidative processes in liver cells. W. D. L.

Iron metabolism in the animal organism after extirpation of the spleen. J. IRGER. *Biochem. Z.* **169,** 417–26(1926); cf. *C. A.* **19,** 2233.—After extirpation of the spleen of dogs, no change in the amt. of Fe in the blood, urine, feces or bile could be detected. Therefore, the theory of Asher that the spleen has a dominating role in the excretion of Fe is not confirmed. W. D. L.

The formation of gastric hydrochloric acid from the chlorides of the blood. J. MOSONYI. *Biochem. Z.* **169,** 120–4(1926).—Rabbits are starved for 12 hrs., and the blood Cl is detd. Then food is given, and Cl again detd at intervals of 2 and 4 hrs. The values after food is ingested are 6–10% below those during starvation. It seems, therefore, that Cl from the blood goes to form HCl in the stomach. W. D. L.

Influence of calcium and of phosphoric acid upon milk. J. ZAYKOVSKII. *Biochem. Z.* **169,** 67–76(1926).—The changes which occur in the milk of cows when $CaCO_3$ and $CaHPO_4$ are added to their regular diet are toward higher values for fat, sp. gr., acidity, total ash, CaO and P_2O_5. W. D. L.

The form of cell membranes and their behavior upon decomposition. J KÖNIG. *Biochem. Z.* **171,** 261–76(1926). W. D. L.

Chemistry of blood sugar in insulin hypoglucemia. Z. ERNST AND G. FÖRSTER. *Biochem. Z.* **169,** 498–500(1926).—Blood during insulin hypoglucemia contains, according to polarimetric findings, sugar equiv. to 51–76% of the total reducing substances present. There is, therefore, no essential change in the ratio of sugar to other reducing substances present during insulin hypoglucemia. W. D. L.

Excretion of calcium injected intravenously. J. DADLEZ. *Biochem. Z.* **171,** 146–55(1926).—Intravenous injections of $CaCl_2$ are made upon rabbits and upon man. Urine and feces are analyzed at intervals for Ca. In rabbits, the injected Ca is all excreted in the urine. In man, $^1/_3$ of the injected Ca is excreted in the urine within 1 day, and the remainder in the feces. In tuberculosis injected Ca is excreted more rapidly. W. D. L.

Resorption from the isolated surviving intestine. II. Influence of saponin upon the resorption of calcium. F. LASCH. *Biochem. Z.* **169,** 301–7(1926); cf. *C. A.* **20,** 3474.—Under the influence of saponin, isolated surviving intestine allows 70–180% more Ca to diffuse through the wall than when no saponin is present. W. D. L.

Experimental acidosis and alkalosis of tissue juice of the frog and changes in the zymoplastic structure. A. RUMYANTZEV. *Biochem. Z.* **171,** 467–72(1926).—The p_H of various tissues of the frog, as detd. by use of indicators, are: skin 7.2–7.4, pancreas 6.9–7.0, kidney 6.8–6.9, liver 6.7–6.8, muscle 6.5–6.6, bladder 7.0–7.2, urine 6.4–6.6. After the injection of satd. solns. of H_3BO_3 or of Na_2CO_3 into the lymph system, the changes in p_H of the tissues over several hrs. are detd. W. D. L.

Agglutination of spermatozoa under the influence of chemical reagents. B. E. KALVARIISKII. *Biochem. Z.* **169,** 355–408(1926).—The effect of a no. of inorg. salts, acids and alk. upon the agglutination of the spermatozoa of the frog is studied. W. D. L.

Lactic acid formation upon the death of smooth muscle. II. E. MANGOLD AND CONSTANZE SCHMITT-KRAHMER. *Biochem. Z.* **169,** 186–91(1926); cf. *C. A.* **20,** 2530.—The lactic-acid content of the smooth muscle from the intestine of the hen is 0.059–0.135%, and as the muscle dies, this increases to 0.104 to 0.323%. The post-mortal formation of lactic acid is slower than with similar muscle from the pigeon, but the increase is relatively greater. W. D. L.

The ammonia content and ammonia formation in blood. IV. Does ammonia occur in the circulating blood? J. K. PARNAS AND A. KLISIECKI. *Biochem. Z.* **169,** 255–65(1926); cf. *C. A.* **19,** 1579; **20,** 1658.—Circulating blood contains 0.02–0.42 mg. NH_3 per 100 cc., depending upon from what artery or vein the blood is taken, and upon the time for which the blood has been kept. This progressive formation of NH_3 as the blood stands may be due to either a bacterial or an autolytic decompn. of some constituent of the blood. W. D. L.

The quotient C : N in the urine in adrenaline glucosuria. H. WADA. *Biochem. Z.* **171,** 264–9(1926).—The total N and C and sugar in the urine of rabbits under normal

conditions, and in adrenaline glucosuria are detd. The C, which is not in the excreted sugar, is used to det. the quotient C:N. This quotient varies little, whereas in diabetes in man, and in phlorhizin diabetes, it varies widely. W. D. L.

Respiration and carbohydrate exchange in animal tissues. I. Lactic acid formation and disappearance in animal tissues. O. Meyerhof and K. Lohmann. *Biochem. Z.* **171**, 381–402(1926).—The respiratory and lactic acid exchange of such tissues as liver, kidney, brain and muscle are studied. The objective is to show whether or not lactic acid goes through the cycle hexose $\underset{\text{synthesis}}{\overset{\text{splitting}}{\rightleftarrows}}$ 2 lactic acid, and whether or not the speeds of the 2 reactions are independent, so that one reaction can be made to predominate, with the effect that lactic acid neither appears nor disappears. The effect of foods upon the cycle is detd. with rats that have starved for 16 to 36 hrs., and the quantities detd. are γ = apparent respiratory quotient = $(CO_2 + \text{lactic acid})/O$ and the true respiratory quotient of the serum, calcd from measurements of O consumption, HCO_3 before, and HCO_3 after + CO_2 evolved during the expt. From these detns. are calcd. Q_m = cu. mm. O per mg. dry wt. per hr. and $Q_M{}^B$ = mg. lactic acid which disappears per mg. dry wt. per hr. This $Q_M{}^B = -Q_m$ of Warburg. Besides these quantities are detd. the rates of glucolysis of smooth muscle from frog intestine in the presence of various sugars. With the hungered rat liver, addn. of Na lactate increases both the respiration and the rate of disappearance of lactic acid 50–100%. The increased respiration in serum with a decreased γ is explained as being due to the presence of lactic acid in the serum. Other tissue behaves similarly. In the presence of glycogen, starch and fructose the glucolytic activity of smooth muscle is slight. Glyceraldehyde and dihydroxyacetone form less lactic acid than glucose, as do also di- and trihexosan. **II. Respiration and carbohydrate exchange in liver and muscle of warm-blooded animals.** R. Takane. *Ibid* 403–20.—The rate of disappearance of carbohydrate from liver and muscle is compared with the O consumption to det. just what part of the O utilized is responsible for the disappearance of the carbohydrate. In the hungered rat diaphragm muscle the carbohydrate disappearance accounts at most for 50% and lactic-acid disappearance for 15% of the O consumed. The rest of the O must be used in the oxidation of protein and fat. In the presence of Na lactate in serum, carbohydrate is synthesized. The respiratory quotient, the amt. of respiration, and the carbohydrate utilization are all increased by the addn. of insulin. In this case, the carbohydrate disappearance agrees more nearly with that calcd. from the O consumption, so that the carbohydrate is oxidized. With the liver in the presence of lactic acid carbohydrate is readily synthesized. In general the behavior of the liver is similar to that of the diaphragm muscle. **III. The difference between *d*-and *l*-lactic acids for respiration and synthesis of carbohydrate in the organism.** O. Meyerhof and K Lohmann. *Ibid* 421–35.—In order to det. the rate at which *d*- and *l*-lactic acids are oxidized by yeast aud muscle, the pure antipodes are added to these materials and the rate of O consumption, CO_2 evolution and lactic acid disappearance are measured. With yeast, there is little difference between the rates of oxidation of the 2 forms, but with muscle the *d*-form is oxidized much more rapidly than the *l*-form. More marked differences are noted with liver and kidney tissue. W. D. L.

The relation of work and heat in tortoise muscle. J. Wyman, Jr. *J. Physiol.* **61**, 337–52(1926).—A maximally tetanized skeletal muscle produced less heat while being stretched than while shortening, whereas the work recorded was greater. It is calcd. that about 35% of the potential energy of the contracting muscle is restored as chem. energy during relaxation. J. F. Lyman

The effects of baths on man. III. Effects of hot baths on respiration, blood and urine. E. M. Landis, W. L. Long, J. W. Dunn, C. L. Jackson and W. Meyer. *Am. J. Physiol.* **76**, 35–48(1926).—After a control period in a neutral bath (36° to 36.5°) the temp. was raised to 40.2–43.0° and maintained for 30 to 65 min. In all of 6 trials, except one, tetany was observed with severe after-symptoms. The changes noted during the hot baths were: hyperpnea, a change in p_H of the blood to the alk. side, and a tendency for the urine to be more alk. than the blood. O_2 did not but CO_2 did relieve the tetany. In 2 cases a change of the p_H of the blood toward the acid side was observed within 2 min. after tetany. J. F. Lyman

Secretin and the portal circulation. J. Mellanby. *J. Physiol.* **61**, 489–93 (1926); cf. *C. A.* **19**, 3109.—Secretin seems to be absorbed from the cells of the mucous

membrane of the small intestine directly into the portal blood and none passes indirectly into the blood through the lymphatic system. Crude exts. of secretin when injected into the portal vein are relatively ineffective because the liver removes from the blood substances with which the secretin is associated in these exts. J. F. LYMAN

Further evidence on the relation of the filtration process to diuresis. H. L. WHITE AND SAM L. CLARK. *Am. J. Physiol.* **78,** 201–5(1926).—The increased excretion of bicarbonate which accompanies the diuresis produced by intravenous injection of NaCl in the anesthetized dog is regarded as proof that during diuresis the rate of glomerular filtration is as rapid as or more rapid than during periods of slower urine flow. J. F. LYMAN

The influence of posture on renal activity. H. L. WHITE, I. T. ROSEN, S. S. FISCHER AND G. H. WOOD. *Am. J. Physiol.* **78,** 185–200(1926).—The influence of posture on the urinary output of H_2O, CO_2, Cl, urea, phosphates, sulfates, NH_4, creatinine, acidity by titration, p_H of the urine, on blood pressure, pulse and circulation rates was measured. The data are used as a basis for the discussion of the mechanisms of urinary secretion. J. F. LYMAN

The inverse change between the concentration of glucose and chloride in the blood. T. G. NI. *Am. J. Physiol.* **78,** 158–67(1926).—Histamine or sham feeding caused a fall of blood Cl in dogs and often a rise in blood glucose provided the adrenals and their nerve supply were intact. After the removal of the pancreas the resulting high blood sugar is accompanied by a marked lowering of Cl. J. F. LYMAN

The internal secretions of the ovary. I. The distribution in the ovary of the estrus-producing hormone. A. S. PARKES AND C. W. BELLERBY. *J. Physiol.* **61,** 562–75(1926).—In the majority of cases (8) examd., the residual tissue had a greater activity than the corresponding liquor folliculi. The name "folliculin" for the estrus-producing hormone is thought to be misleading. The name "estrin" is suggested. J. F. LYMAN

Conditions of activity in endocrine glands. XVIII. Locus of the calorigenic action of adrenaline with observations on tissue metabolism. H. B. HUNT AND ELIZABETH M. BRIGHT. *Am. J. Physiol.* **77,** 353–70(1926).—The O_2 consumption of cats was detd. under amytal anesthesia, before and after tying off the blood vessels to certain organs, and before and after the injection of adrenaline. Adrenaline has a general stimulating effect on tissue metabolism. The basal metabolism in muscle is low (0.5 to 1.0 cal. per kg. per hr.), in liver it is high (10 to 20 cals. per kg. per hr.); in the other viscera it is intermediate (2 to 3 cals. per kg. per hr.). J. F. LYMAN

The secretion of pancreatic juice. J. MELLANBY. *J. Physiol.* **61,** 419–35(1926).—Cholic acid introduced into the cat duodenum caused a copious secretion of pancreatic juice. Secretin, contained in the cells of the intestinal mucosa, is carried into the portal blood, associated with the bile salts, in the fluid absorbed from the intestine. Bile is of importance, therefore, in effecting the transfer of secretin from the site of its formation (the intestine) to that of its action (the pancreas). The influence of acidity, bile salts and mucin was studied. J. F. LYMAN

The spleen and the resistance of red cells. D. ORAHOVATS. *J. Physiol.* **61,** 436–47(1926).—The red blood cells in the spleen pulp were less resistant to hypotonic salt solns. and more resistant to saponin solns. than cells from the general circulation. It is probable that the P content of the two types of cells differ. J. F. LYMAN

The content of lactic acid and the development of tension in cardiac muscle. A. C. REDFIELD AND D. N. MEDEARIS. *Am. J. Physiol.* **77,** 662–8(1926).—The ability of the ventricular muscle of the turtle to develop tension and its content of lactic acid are closely correlated. J. F. LYMAN

The influence of burns on adrenaline secretion. F. A. HARTMAN, W. J. ROSE AND E. P. SMITH. *Am. J. Physiol.* **78,** 47–9(1926).—Burns caused an increase in the output of adrenaline in cats. J. F. LYMAN

The effects of asphyxia and isletectomy on the blood sugar of Myoxocephalus and Ameiurus. W. W. SIMPSON. *Am. J. Physiol.* **77,** 409–18(1926).—Either asphyxia or the removal of the islet tissue caused hyperglucemia in the fishes *Myoxocephalus* and *Ameiurus.* Hydrolysis of the blood of *Ameiurus* results in a marked increase in reducing power. This increase is much less in the blood from asphyxiated animals suggesting that the extra blood sugar in asphyxia is due to the formation of reducing sugars from other carbohydrate compounds. J. F. LYMAN

Heparin. III. Effect on coagulation time when added to blood after clotting has begun. C. I. REED. *Am. J. Physiol.* **77,** 568–9(1926).—Even after the process of coagulation has begun, the addition of relatively small amts. of heparin may prolong coagulation time to a marked degree or even arrest the process entirely. J. F. L.

The influence of the vagus on the islets of Langerhans. II. The effect of cutting the vagus upon sugar tolerance. G. A. CLARK. *J. Physiol.* **61,** 576–82(1926).—See *C. A.* **20,** 2532. J. F. LYMAN

Studies in comparative biochemistry. II. Behavior of aromatic fatty acids and of pyridine in the organism of lower animals. Y. KOMORI, Y. SENDJU, J. SAGARA AND M. TAKAMATSU. *J. Biochem.* (Japan) **6,** 21–6(1926).—Frogs receiving subcutaneous injections of benzoic, phenylacetic and phenylpropionic acid eliminate in the urine hippuric acid. The same has been observed in turtles receiving subcutaneously Na benzoate. The turtle likewise methylates injected pyridine; it is excreted through the urine as methylpyridylammonium hydroxide. S. MORGULIS

Animal calorimetry. VII. The influence of hematoporphyrins on body temperature and energy exchange. LADISLAUS KAJDI. *Biochem. Z.* **170,** 201–23(1926).—Subcutaneous injections of hematoporphyrin dissolved in 1% Na_2CO_3 cause a rise in body temp. and in the energy metabolism. The rise in body temp. is of brief duration, while the increase in energy metabolism lasts much longer. It follows, therefore, that the rise in metabolism does not depend upon the temp. rise, but that both effects are produced by the injected hematoporphyrin. The nature of the metabolic process is apparently unaffected, as may be judged from the unchanging respiratory quotient. The Na_2CO_3 soln. in which the hematoporphyrin is dissolved does not of itself have any influence either on the body temp. or on the metabolism. S MORGULIS

Contributions to the physiology of high altitudes. I. Effect of diminished air pressure on the p_H and the carbon dioxide-binding capacity of the blood. G FRITZ. *Biochem. Z.* **170,** 236–43(1926).—Reduced atm pressure, under natural or artificial conditions, as a result of diminished O_2 supply leads to an acidosis of the organs which manifests itself through a shifting of the blood p_H and the reduction of its CO_2-combining power. Carnivorous cats compensate this acidosis with greater difficulty than herbivorous rabbits. S. MORGULIS

Insulin secretion following vagus stimulation or ligation of the portal vein. GUNNAR AHLGREN *Skand. Arch Physiol.* **48,** 1–7(1926).—The insulin content of skeletal muscles was studied in rabbits under urethan anesthesia. The insulin was detd. by A.'s methylene-blue method, both before and after weak stimulation of the right vagus nerve. The low insulin content before stimulation is replaced by an excess after stimulation, leading to the conclusion that vagus stimulation causes an outflow of insulin from the isles of Langerhans. Ligating the portal vein produces the same result. The venous stasis thus produced is associated with a vigorous lymph formation which in the pancreas seems to be associated with an increased insulin secretion. It also proves that insulin may be removed from the pancreas by way of the lymphatics. S. MORGULIS

The metabolism of dancing. G. GRONHOLM, I. SANDBACKA, O. G. STENROS AND V. YLANCKO. *Skand. Arch. Physiol.* **48,** 125–8(1926).—The energy metabolism per kg. and per hr for different dances (duration of expt. was 15 or 30 min.) was as follows: waltz, 3.99 cal.; shimmy, 4.02 cal.; schottische, 4.76 cal.; foxtrot, 4.78 cal.; polka, 7.56 cal.; mazurka, 10 87 cal. S. MORGULIS

Physiological ontogeny. A. Chicken embryos. X. The temperature characteristic for the contraction rate of isolated fragments of embryonic heart muscle. H. A. MURRAY, JR. *J. Gen. Physiol.* **9,** 781–8(1926); cf. *C. A.* **20,** 2532.—No constancy in the values of μ (Arrhenius' equation) for the rate of contraction in culture was found No correlation seems to exist between μ and such functions as the contraction rate, the site from which the piece of tissue is removed, age of embryo, etc. **XI. The p_H, chloride, carbonic acid and protein concentrations in the tissues as functions of age.** *Ibid* 789–803.—The p_H and Cl concns. of the tissues decrease with age, the fall being most rapid at 10–13 days of incubation. CO_2 concn. increases with age and possibly represents a decrease in active HCO_3 ions. The concn. of protein increases with age especially at 12–16 days of incubation. The fact that electrolytes change most rapidly at 11.5 days, protein at 14 days and fat at 16.5 days seems to indicate unequal development in biochem. differentiation and perhaps "some notion of order, depending upon mol. reactivity and mobility would describe the process better than any concept of dynamic equil." C. H. R.

Fluctuations in the amount of blood corpuscles. ARTHUR SCHEUNERT AND FR. WILHELM KRZYWANEK. *Arch. ges. Physiol.* (Pflüger's) **213,** 198–205(1926).—The increased amt of blood cells assocd. with muscular activity in the horse is accompanied by an increase in the refractive indices of plasma and serum, a change to be ascribed to an increased protein content since the salts and org. dissolved non-protein substances are not changed by activity. G. H. S.

Significance of antineuritic (B) vitamins for the renewed formation of feathers. JAROSLAV KŘÍŽENECKÝ AND IVAN PETROV. *Arch. ges. Physiol.* (Pflüger's) **213,** 5–18 (1926).—The presence of antineuritic vitamins in the diet is essential to the new formation of the plucked feathers of pigeons. Not only is it necessary in providing the initial impulse for regeneration but it also regulates in large measure the further course of their development. To such an extent is this true that the regenerative process can be used for estg. the vitamin content of the diet, but to exclude the rather great individual variations a large no. of pigeons must be used. G. H. S.

Antagonism between thymus and thyroid. TOKURIU TAKAO. *Arch. ges Physiol.* (Pflüger's) **213,** 192–7(1926).—An antagonism between thymus and thyroid with reference to changes in the carbohydrate content of the rat liver could not be disclosed As regards body wt. an antagonistic relation exists, in that thymus feeding causes a slight increase while thyroid feeding results in a considerable loss. G. H. S.

Sodium and the automatism of the heart. W R. WITANOWSKI. *Arch. ges. Physiol* (Pflüger's) **212,** 726–34(1926).—By reducing the concn of NaCl in Ringer soln. it is possible to abolish the tendency of the heart to paradoxical and group-formation reactions, an effect in no way due to changes in the osmotic pressure Reducing the Na concn. acts in the same way as increasing the K concn. A heart placed in a K-free fluid pulsates longer in 0 3% NaCl than in 0.65% NaCl, indicating that the changes in cell surface induced by NaCl, requisite for the occurrence of disturbances in automatism, can be conceived of as an effect on the permeability for K. This change in state of cell surface has a latent period of 2 3 min , depending on the concns. of salts used. G. H S.

Ionic theory of stimulation. IX. Theory of darkness adaptation after intense previous illumination. P. LAZAREV. *Arch. ges. Physiol.* (Pflüger's) **213,** 256–61 (1926).—The development of the general theory (the reaction of pigment restitution is a reaction of the *n*th order) that adaptation curves correspond in form with the curve for monomol. restitution. G. H S.

Protein and urea content of horse sweat. HANS RITTER. *Arch. ges. Physiol* (Pflüger's) **213,** 544–7(1926)—The protein content varied between 1.95 and 3 47% (av. 2.75%). Apparently the external temp. influences the protein content, for during the warmer portion of the period over which the tests were made higher values were obtained. The av. urea content was 0 14%. G. H. S.

Hydrogen-ion concentration of horse sweat. HANS KORKISCH. *Arch. ges. Physiol.* (Pflüger's) **213,** 539–43(1926)– Of 3 groups of horses tested, the av. values were p_H 8.377, 8 564 and 8.527. G. H. S.

Amino-acid excretion in the urine in cows, horses and goats, and the effect of pregnancy upon the excretion in cows. K. STEINMETZER AND R. STRAKOSCH. *Arch. ges. Physiol.* (Pflüger's) **213,** 535–8(1926).—The av. value for amino acid N in horses is 0.0186%, in goats 0.0048%, in non-pregnant cows 0 013%, and in cows during pregnancy 0.00028%. G. H. S.

Significance of potassium ions for the tonus of striated skeletal muscle. V. The tonic component of strychnine tetany and its modification by peripherally attacking agents. S. M. NEUSCHLOSS. *Arch. ges Physiol.* (Pflüger's) **213,** 40–6(1926); cf. *C. A.* **19,** 1302.—The increased binding of K assocd. with increased muscle tonus due to strychnine is not modified by curare, but is reduced by atropine. **VI. Effect of the electrolytes of the fluid on the amount of bound potassium in the muscle.** *Ibid* 47–57.—If the isolated gastrocnemius of the toad is placed in different solns. the compn of the soln. modifies the amt. of K bound to the muscle only when there is rhythmic stimulation. In solns. which are free from or very poor in electrolytes stimulated muscle retains its normal value of bound K, but with higher salt concns. this value changes in accord with the relationship of the ions of the fluid in which the muscle is suspended. Solns. contg neither K nor Ca, but with NaCl as the sole electrolyte, cause the muscle to lose a part of its bound K. The K and Ca ions of the suspension fluid exert opposite effects upon the amt. of K bound to the muscle; K increases it; Ca reduces it. In a suitable relationship between the ions the forces are balanced, a normal value being retained. The effect of Ca ions upon tonus inhibition does not parallel its effect upon K binding. Hypotonic solns. favor K fixation to muscle; hypertonic solns. inhibit the process. **VII. The physico-chemical conditions for ion fixation to hydrophile gels.** S. M. NEUSCHLOSS AND KURT WALTER. *Ibid* 58–73.—If a practically ash-free gelatin is melted in the presence of K ions and is subsequently allowed to cool at room temp. the resulting gel contains K in 3 different forms: (*a*) as inorg. freely diffusible salt, (*b*) as cation bound in ionized form to the protein (possible only on the alk. side of the isoelec. point); and (*c*) in a firmly bound condition—an

"internal binding." Under like exptl. conditions the amt. of K to combine in the last way is strictly proportional to the concn. of protein present. With only a K salt present, the combination, at p_H 7.3, represents the union of 1 g. of N and 0.0077 g. of K. If other cations are present also a portion of the K to combine with the protein is replaced and the K bound is thus diminished, but this substitution takes place only when the cations are added to the melted gelatin. When the gelatin with the K salt has once hardened the amt. of K which has entered into the "internal binding" is not altered The degree of "internal binding" is also dependent upon the imbibition tendency of the gelatin. Those things which favor swelling increase K fixation; agents which diminish the capacity for imbibition reduce the binding. Unlike the ionized K, the K internally bound combines on either side of the isoelec. point, but here a min. is reached which corresponds with the point of minimal swelling manifested by the gel at a given reaction. Thus the effect of the H-ion concn. on the process parallels that exerted on the hydration of the gelatin. G. H. S.

Effect of organ extracts, of corpus luteum extracts in particular, upon the coagulation time of the blood. FRITZ ALTZINGER. *Arch. ges Physiol.* (Pflüger's) **213,** 548–55 (1926).—Aq exts. of corpus luteum, made to 0.85% NaCl for use, inhibit blood coagulation, while alc and ether exts., similarly made isotonic, favor coagulation. The difference in action between the aq. and the alc. or ether exts is more marked at low temps (tests at 37° are not always differential). The coagulation-stimulating substance is sol. in alc and ether. The action is not sp. to corpus luteum ext, since like results are obtained with exts. prepd. in the same ways from liver, spleen and ovary. G. H. S

Oxygen utilization by man in climbing. ADOLF SIGRIST *Arch ges. Physiol* (Pfluger's) **212,** 741-58(1926).—The effects of the inclination of the pathway and the walking speed in the treadmill upon O use were detd, showing that with small increases (7 and 14%) in speed no effect on O use per unit (movement of 1 kg. of body wt. a distance of 1 m.) occurred. With greater increases in speed (28-42%) the O use diminishes. Inclining the pathway between 7 and 21% caused no great change in the const. Within this region it amounts to 7.1–7.45 g. cal. per m.-kg. High gradients of 35–42% increase the const. G. H. S

Sweat production in dogs. KARL EIMER *Arch. ges. Physiol.* (Pflüger's) **212,** 781–6(1926).—Noticeable sweating takes place in dogs aftert he injection of pilocarpine (0.01–0 02 g), the amt. (under av. atm. conditions) being about 2 g. per hr. The sweat yield increases as the external temp is raised. Pilocarpine also increases the insensible perspiration; atropine diminishes it. G. H. S.

Behavior of amino acids and of sucrose after introduction directly into the circulation and after introduction into the digestive tract. EMIL ABDERHALDEN AND E. S. LONDON. *Arch. ges. Physiol.* (Pfluger's) **212,** 735-40(1926).- After the administration of racemic amino acids (*dl*-valine and *dl*-leucine) directly into the circulation (dogs) optically active substances, not normally present, can be detected in the thoracic lymph. When given by mouth or through an intestinal fistula they can be detected in the thoracic lymph. When *l*-tyrosine is injected into the circulation, this amino acid can be demonstrated in small quantities in an unchanged condition if it has not had an opportunity to pass through the liver In the venous blood of the liver, products which indicate a decompn of tyrosine can be found Phenol-like substances can be isolated. Probably also, *p*-hydroxyphenyllactic acid is found. After introduction into the intestinal tract sucrose and lactose cannot be detected in the blood of the portal vein. G. H. S.

Potassium fixation in the ventricular muscle and its significance in heart function. S. M. NEUSCHLOSS. *Arch. ges. Physiol.* (Pfluger's) **213,** 19–39(1926).—The amt. of bound K in the ventricular muscle of the toad is materially greater than that in the skeletal muscle of the same animal, representing usually 0 2–0 25% of the dry wt. When the isolated heart is treated with a K-free fluid a persisting diastole results, and the amt. of bound K is reduced, the reduction being the more marked as the Ca concn. of the fluid is increased. Increasing the Ca concn in the presence of K ions causes systolic arrest, but a further increase in K causes diastolic arrest. Under these conditions the amt. of bound K is increased by Ca, reduced by K, while in a balanced soln. a normal value for bound K results. When the Ca content is held const. an increased fixation of K to the muscle occurs with increases in K ions, the max. reached being greater with higher concns. of Ca. In principle the isolated ventricle responds to changes in ions as does the whole heart, the essential difference in behavior being a greater sensitivity of ventricle over auricle, so that the K/Ca optimum is reduced to about $^1/_5$. Like the heart, the isolated ventricle goes into systolic arrest with increase, into

diastolic arrest with reduction of the K fixation. The response of the apex of the heart, differing from the higher portions, corresponds to that of skeletal muscle. Diastolic arrest caused by 1:1,000,000 acetylcholine-HCl is attended by a loss in both the total and the bound K of the ventricle, while with the apex of the heart the same treatment causes but an insignificant loss in contractility and no change in K fixation. G. H. S.

Muscle contraction. II. Absorption of water by stretched and relaxed muscle. E. Ernst. *Arch. ges. Physiol.* (Pfluger's) **213,** 131–2(1926).—Stretched muscle swells far less than unstretched. The reduction in vol. of muscle in contraction cannot be the result of an imbibition. **III. Perfusion experiments.** *Ibid* 133–43.—Hypertonic solns. cause a prompt and rapid reduction of contractions or even their complete disappearance. **IV. Reduction of volume and performance of work.** *Ibid* 144–58.—Work performance or the development of tension and reduction in vol. of the muscle run approx. parallel. A diminution in vol. of 0.02 cm. corresponds to an av. of 0.001 kg./m. of work and about 300 g. tension development. G. H. S.

Regulation of metabolism. I. Metabolism of fat. Central regulation of fat mobilization. Ernst Wertheimer. *Arch. ges. Physiol.* (Pfluger's) **213,** 262–79 (1926).—The mobilization of fat depots and the manifestations assocd. therewith, particularly the occurrence of a fatty liver, are primarily dependent upon the central nervous system, as is shown by section of the thoracic cord during acute and subacute phlorhizin intoxication expts. In such expts., after section, lipemia does not occur, but even if the liver is completely deprived of nerves it is still able to bind fat in large amts. Section below the 7th thoracic vertebra does not alter fat mobilization. When fat regulation is deranged there is a marked reduction or even an approx. complete lack in the formation of acetone bodies, a change which does not take place if the section is below the 7th. **II. Regulation of fat mobilization by internal secretions.** *Ibid* 280–6.—In all cases insulin inhibits fat mobilization in animals treated with phlorhizin. With large doses of insulin the inhibition is complete, a transfer of fat does not take place, and a fatty liver never develops. Large doses of adrenaline are necessary to inhibit fat transfer and then the inhibition is never complete. With amts. which induce no significant hyperglucoplasma, inhibition is not evident. **III. Influence of nervous action and internal secretions on the rearrangement of fat in the liver.** *Ibid* 287–97.—After section of the upper thoracic cord the transformation of fat in a fatty liver (induced by phlorhizin) is markedly favored. After section of the liver nerves, the same thing takes place. Simultaneously with the disappearance of fat there occurs an increase in the glycogen of the liver. Insulin favors the transformation of fat in the liver, and at the same time the glycogen content increases. After adrenaline prompt transformation of fat occurs in the liver, with the simultaneous development of new carbohydrate. **IV. Effect of internal secretions on the transformation of fat into carbohydrate in the liver.** *Ibid* 298–320. Dogs which have lost large amts. of sugar after treatment with phlorhizin and in which the carbohydrate of the body is impoverished, whose liver contains only traces of glycogen but large amts. of fat, are definitely less susceptible to insulin than are dogs which have simply been deprived of food during the preliminary period or have had their normal nourishment up to the time of the insulin treatment. This difference in behavior is regular and is expressed in the blood-sugar curve. Further, in both the manifestations of insulin intoxication occur, somewhat weaker in the phlorhizin dog than in the control. The phlorhizin dog then quickly recovers, the control gradually. The blood-sugar curve falls in both, then in the phlorhizin dog there is an abrupt rise to a level usually above the initial value; while in the control dog if death does not occur, the blood sugar comes back but very slowly. Since through the action of insulin fat disappears from the liver and simultaneously glycogen makes its appearance, the only explanation is that the sugar must arise in some way from fat through the action of the insulin. Dogs so treated with phlorhizin that they have excreted large amts. of sugar in the urine, and whose liver contains but minimal amts. of glycogen but abundant fat, react to adrenaline with a much stronger and lasting hyperglucoplasma and general reaction than do control dogs which were starved during a short preliminary period, or which had been upon a normal diet prior to the adrenaline administration and whose glycogen relations must have been normal. Dogs previously treated with phlorhizin react to subcutaneous administration of dextrose with a stronger hyperglucoplasma than do completely normal dogs. G. H. S.

Behavior of ammonia-mother substance in the blood and its significance in the regulation of neutrality. D. Adlersberg and M. Taubenhaus. *Arch. exptl. Path. Pharmakol.* **113,** 1–39(1926).—Studies made on the normal subject showed that in man the NH_3 parent substance of the blood is practically const. and is not modified by short

periods of unbalanced diet or of muscular activity. Profound acidosis or alkalosis, of exogenous origin, is also without effect. Only with profound acidification of the body does the preformed NH_3 increase materially in the blood, while the increase of NH_3 parent substance varies within narrow limits. On the contrary with large doses of alkali the amt. of NH_3 mother substance in the blood diminishes. NH_4 salts given intravenously disappear very promptly from the circulation. In endogenously induced acidosis of high degree a significant reduction in the NH_3 mother substance in the blood occurs without exception. Studies made in pathological conditions showed that those disturbances which lead to an NH_3 excretion in the urine show a reduction of NH_3 mother substance of the blood. The lowest values are found in liver diseases despite the fact that the excretion of NH_3 in the urine is very slight. Low values are observed also in chronic under-nourishment, malign neoplasms and chronic diarrhea. Only in the extreme hyperacidity of diabetic coma is the value increased above normal. G. H. S.

Amino nitrogen of the blood in experimentally induced febrile conditions. JULIUS DONATH AND ROBERT HEILIG. *Arch. exptl. Path Pharm.* **113**, 201–15(1926); cf. *C. A.* **19**, 1735.—Nucleic acid, as well as vaccineurin, given intravenously in suitable doses, causes rise in temp., together with an increased amino N of the blood and an increased excretion of N in the urine. Manipulation of the heat center or the administration of tetrahydro-β-naphthylamine causes hyperthermia but no increase in either the amino N of the blood or the N excretion in the urine. In some cases the injection of nucleic acid after a previous puncture caused neither fever nor increased protein decompn., but in other cases where the heat center retained irritability the nucleic acid was effective. It thus appears that the central regulatory mechanism for protein metabolism is functionally dependent upon an intact heat center. G. H. S.

Significance of microörganisms in the intestinal tract of herbiverous animals in relation to the physiology of nutrition. I. Nitrogen distribution of the contents of the cecum of the horse with regard to the nitrogen content of the microörganisms. CARL SCHWARZ AND GUSTAV BIENERT *Arch ges. Physiol.* (Pfluger's) **213**, 556–62 (1926).—Of the total N present, 26.8–36 2% is in soln., 9.4–18 4% is bacterial N, 18.8–32.8% is infusorial N, and 22 4–36.8% is food residue N. **II. Fate of microörganisms in the advance from the cecum to the rectum of the horse.** CARL SCHWARZ AND JOSEF TANZER. *Ibid* 563 70.—The percentages resorbed are as follows (av. figures); dissolved N 78.3, bacterial N 6.3, infusorial N 69 5, food residue N 0. The values for dissolved N and infusorial N are fairly uniform and always high; for bacterial N the figures vary from 0 to 14 0. **III. Accumulation of undissolved pepsin-digestible protein (infusorial protein) in the cecum of the horse.** CARL SCHWARZ AND ALOIS ERBEN. *Ibid* 571–6.—In the cecum of the horse there occurs an accumulation of undissolved pepsin-digestible protein, most probably in the form of infusorial protein An increase in bacteria does not take place in the cecum, only in the colon is this first evident. G. H. S.

G—PATHOLOGY

H. GIDEON WELLS

Experimental hypoglucemia and hyperglucemia in the chick embryo. E. B. HANAN. *Proc. Soc. Exptl Biol. Med.* **22**, 501–4(1925).—The normal blood sugar of a 14- to 16-day chick embryo varies between 209 mg. and 296 mg. per 100 cc. The blood depletion resulting from repeatedly withdrawing 0.1-cc. samples caused a considerable increase in blood sugar. The injection of 100 mg. of glucose in 0.5 cc. H_2O into the air sac caused the blood sugar to increase from 221 mg. to 859 mg. in 1 hr.; return to normal took place in 4 hrs. Insulin caused hypoglucemia; large doses were tolerated as in birds. Blood-sugar detns. were by the Hagedorn Jensen volume method; a special technic was used for obtaining the blood. C. V. B.

The excretion of an acid urine in alkalosis. V. C. MYERS AND L. E. BOOHER. *Proc. Soc. Exptl. Biol. Med.* **22**, 512 3(1925).—Two cases are reported where the urine remained strongly acid despite the presence of alkalosis. The reaction of the urine is not always a safe guide for discontinuing alkali administration. C. V. B.

Further observations upon tuberculosis inoculata of the guinea pig. G. R. ROSS AND W. J. TULLOCH. *Tubercle* **7**, 265–76, 321–32(1926).—Diaplyte vaccine was not found to exhibit any therapeutic action. Tuberculin ointment administered in vaseline with a view to obtaining depot action also failed to modify the progress of the disease. Attempted immunization with an avirulent living culture proved unsuccessful, possibly because of early discharge, through ulceration, of the original inoculum. The importance of removal of all excess of moisture from the bacilli is clearly shown. The action

›f certain oils upon *B. tuberculosis* is sp.; in fact these oils may be markedly lethal to that nicroörganism without exhibiting a corresponding lethal action on other microörgansms. This lethal action of the oils is not related to the I value. The lethal effect of ›live oil is to some extent dependent upon its content of free oleic acid. H. J. C.

Complement binding in tuberculosis. MAX PINNER. *Z. Tuberk.* **44,** 49–52(1925); :f. *C. A.* **20,** 1444.—As a result of 2000 tests with Wassermann's antigen, as well as various alc. exts. of tubercle bacilli, and the antigen of Bocquet and Negre, it was found hat only 24 to 37% of the findings proved correct. The active antigen is found in the ıcetone-insol. alc.-sol. fraction of the tubercle bacillus. The complement-binding ıntibodies of tuberculosis are not globulins and are not digested by trypsin but appear .o be lipoids or proteins with the CO-NH combination. Sp. lipases capable of hydroyzing the lipoids of the tubercle bacillus were not demonstrable in tuberculous serum, ıs detd. by the stalagmometer method and the plate method of Bergel. H. J. C

The value of the erythrocyte sedimentation rate and the urochromogen reaction n the prognosis of pulmonary tuberculosis. SEKI HAKKI. *Beitr. Klin. Tuberk.* **52,** 255–61(1925).—The sedimentation reaction is of no value in prognosis. During ıemoptysis there is an increase in the rate. The Weiss reaction parallels prognosis ›etter and during hemoptysis it becomes stronger. In order for the diazo test to be:ome positive urochromogen must be present in large amts. H. J. CORPER

The behavior of the blood picture, sedimentation reaction, intracutaneous reaction, :uberculosis Wassermann reaction and adrenaline and potassium calcium mirror in the ›lood serum in cases of tuberculosis. K. HENIUS, RICHERT AND BING. *Beitr. Klin. Tuberk.* **62,** 262–73(1925).—As the result of a study of the hemoclinic status and clinical ›bservations it is concluded that the findings in the individual reaction do not always ıgree with the clinical findings; it is not advisable to det. the prognosis from the hemo:linic status alone, and to complete a diagnosis in early tuberculosis the hemoclinic status should be utilized as an entirety rather than a single reaction. In cases with ıemoptysis the tuberculosis Wassermann was frequently neg., probably because of the presence of a large amt. of antigen in the circulating blood, with temporary binding ›f the antibodies. In many cases an increase in the serum Ca occurred coincidently with a decrease in the serum K, and *vice versa.* H. J. CORPER

Colloid lability reactions in tuberculosis. M v. LEMESIC AND V. KOSANOVIC. *Beitr. Klin. Tuberk.* **62,** 277–82(1925) —Of the colloid lability reactions used in tuber:ulosis the sedimentation, the Matefy and the $AgNO_3$ reactions proved serviceable, while the Daranyi and Klausner reactions were not sufficiently sensitive. The sedimentation reaction proved of most value because its delicacy and scope of reaction exceeded that of the others. H. J. CORPER

Tuberculosis and the acidity of inflammation. H. SCHADE AND F. CLAUSSEN. *Beitr. Klin. Tuberk.* **62,** 300 7(1925).—Tubercle bacilli were grown upon glycerol potato nutrient medium and protein-free Lockemann synthetic nutrient medium of different H-ion concns, and there was found a relation between the acidity and the growth of the tubercle bacilli. In addn. it was found that inflammatory conditions (staphylococcus and streptococcus infections) produced an acidity of the inflammatory fluids. This is correlated with the unfavorable influence of the occurrence of a mixed infection upon tuberculosis and it is believed that these observations are of far-reaching clinical interest. H. J. CORPER

Lipoid irritants in tuberculosis therapy. I. F. MATTAUSCH. *Beitr. Klin. Tuberk.* **62,** 393–7(1925).—Injections of lecithin solns call forth definite irritation of the leucocyte apparatus in cases of phthisis, especially affecting the sites of formation of lymphocytes, monocytes and the myeloid leucocytic app. An affirmative answer is given to the question of the irritating action of the leucocytic components of "Lipatren" upon the tuberculous organism H. J. CORPER

Tuberculin: A report of a conference on its standardization. *Tubercle* **7,** 543–67, 597–613(1926). H. J. CORPER

Testing of the liver function. Isolation and identification of the *d*-galactose excreted with the urine. J. HALBERKANN AND H. KAHLER. *Z. physiol. Chem.* **154,** 34–8(1926).—The *d*-rotatory substance present in urine after ingestion of large amts. of galactose in certain diseases affecting the liver function has been regarded as *d*-galactose solely on the basis of its conversion into mucic acid by oxidation with HNO_3 Since a methylhexose might also yield mucic acid, further proof of the identity of the substance was desired. By treatment of the urine with $Pb(OAc)_2$, H_2SO_4, $Ba(OH)_2$ and CO_2 and finally crystg. the residue from EtOH, pure *d*-galactose was isolated and positively identified by its m. p., sp. rotation, oxidation to mucic acid, and prepn. of its phenylosazone. A. W. DOX

The behavior of blood toward gum arabic after immunization with the polysaccharide. KOFU NAGASHIMA. *Acta Scholae Medicinalis* 7, II, 271-6(1925).—Subcutaneous injections of 10% gum arabic soln. into rabbits gives rise to a blood serum contg. an enzyme capable of increasing reducing sugars on digesting samples of serum with 20% gum arabic solns. at 37° for 24 hrs. The serum of normal controls fails to show this effect. It appears that 1 subcutaneous injection of the polysaccharide yields a serum as potent in its sp. fermenting action as does that of an animal which has received numerous injections. W. F. GOEBEL

Are carcinoma of the upper urinary tract and prostate especially common among workers in chemical plants? RUDOLF OPPENHEIMER. *Deut. med. Wochschr.* **52,** 1342-3(1926).—A case of carcinoma of the ureter and one of the prostate are described as occurring in laborers in chem. plants. These are to be classed with carcinoma of the bladder as liable to result from the const. irritation of chemicals. A. G.

The effect of excretion of acids and bases upon the development of acidosis in experimental diabetes. B. M HENDRIX, MARION FAY, DEA B CALVIN AND MEYER BODANSKY *J. Biol Chem.* **69,** 449-73(1926).—Acidosis, as measured by the CO_2 capacity of the blood in depancreatized dogs, occurred only when the urine vol. became relatively large. Diuresis is, therefore, suggested as a factor in the production of diabetic acidosis. Acids, other than the acetone acids, form a large proportion of the total org. acids eliminated. The fixed bases of the blood did not vary with the CO_2 capacity but rather with the chlorides and other acid radicals of the blood.
ARTHUR GROLLMAN

The lactic acid content of cerebrospinal fluid. JEROME GLASER *J. Biol. Chem.* **69,** 539-47(1926)—The lactic acid content of 50 specimens of cerebrospinal fluid and 30 specimens of blood were detd. The normal spinal fluids contained 11 to 27 mg. per 100 cc which was 60% of that present in the blood. In 14 cases of cerebrospinal syphilis, the lactic acid values were normal or low. In 2 cases of acute non-luetic meningitis and 1 case each of brain abscess and xanthochromia, there was an absolute increase in the spinal-fluid lactic acid. Of 9 cases of brain tumor, the lactic acid was increased absolutely in 3 cases, and relatively in 1 case. ARTHUR GROLLMAN

Some changes in the acid-base equilibrium of the blood caused by hemorrhage. MARY A. BENNETT. *J Biol. Chem* **69,** 675-92(1926)—After large hemorrhages in dogs there is a rapid fall in the p_H and alkaline reserve of the blood. The latter rises quickly and is normal by the following day. The p_H in the meantime rises higher than the normal, to which it returns after several days. ARTHUR GROLLMAN

Anaphylatoxin-like properties induced in guinea-pig serum on standing for some time in contact with air. H. DOLD. *Klin Wochschr.* **5,** 1472(1926).—Serum that is agitated becomes cloudy and exhibits anaphylatoxin-like properties (cf. *C. A.* **20,** 3186). Merely standing in contact with air for 6 10 days will produce the same changes in serum. MILTON HANKE

Blood, lactic acid and carcinoma. H. E. BÜTTNER. *Klin. Wochschr.* **5,** 1507-8 (1926).—The lactic-acid content of blood is usually not elevated in carcinoma. An elevation does, however, occur when the liver is involved or when the disease is associated with a severe anemia. The increased concn of lactic acid in anemia may not be due to a general asphyxiation but is more likely due to asphyxiation of the liver.
MILTON HANKE

Etiology of cancer. A. PHILIPPSON. *Klin Wochschr.* **5,** 1913-6(1926).—A collection of facts from the literature and from personal observation that indicate that cancer can be definitely associated with unsatd. derivs., most of them nitrogenous, such as aniline, benzidine, nicotine, pyrrole derivs. and the tars formed by the condensation of non-nitrogenous unsatd. compds., such as acetylene and isoprene. These poisons need not act at the site of application and the effect need not be immediate. They can be carried to susceptible parts of the body by the blood. One of the most potent and unavoidable factors is the pyrrole derivs. that are liberated from hemoglobin when the latter is destroyed with loss of Fe. Curiously enough the tissues most frequently affected by cancer are the ones in which Fe deposits occur, *e. g.*, the alimentary tract and the mammary glands. Light appears to be a factor in converting hematoporphyrin into toxic products. MILTON HANKE

Split products of the tubercle bacillus. II. H. JASTROWITZ AND M. WEINBERG. *Z. ges. exptl. Med.* **48,** 392-410(1926).—From various tuberculin prepns. an albumose fraction was isolated having the activity of tuberculin as shown by intracutaneous tests in man and guinea pigs and cutaneous tests in man. The active substance seemed to be deuteroalbumose C and further fractionating with CH_3OH did not succeed. A peptone fraction sol. in CH_3OH was also isolated which showed to a slighter degree

the activity of tuberculin in man and animals. It is probable that the toxin of tuberculin is not a simple substance. The protein fraction of tuberculin is not responsible for the toxic action, as tuberculin prepns. freed from protein by ultra-filtration or coagulation by heat are still active, while the residue which should contain the protein is without effect. Whether the active principle appears with the albumose or peptone by adsorption or is identical with them cannot be decided at present. H. F. H.

Wassermann reaction. IV. Chemical studies of the Wassermann substance and of the antibodies. J. FORSSMAN *Acta Path. Microbiol. Scand.* **1,** 5–22(1924); cf. *C. A.* **19,** 678.—F. designates as WS the substance which is the cause of the positive Wassermann reaction of syphilitic sera. Formol in small doses acts upon Wassermann positive sera so that it destroys the WS. A similar effect is exerted upon the Sachs-Georgi reaction. The destructive action of formol upon the WS scarcely develops at 8°; at 37° it develops very slowly and at 56° rapidly. This behavior suggests that the WS is not an amino acid. Antibodies except antitoxins are destroyed by formol in exactly the same way. The reaction formol-antibodies is not reversible since antibodies so destroyed are not restored by adding amino acids. The fact that the reaction formol-WS and formol-antibodies are identical suggests that the WS is a special substance. E. M. HUMPHREYS

Studies on the fat-cholesterol content of the blood in rabbits suffering from an artificial nephritis. H. I. BING, H. HECKSCHER AND J. JESSEN. *Acta Path. Microbiol Scand.* **2,** 234–43(1925).—This study is based on the observation that it is possible to induce a cholesterolemia and lipemia in rabbits by inducing an acute anemia. The authors sought to det. if a similar increase could be observed in rabbits suffering from an artificial nephritis, comparable to the increase observed in nephritis (nephrosis) in man. A typical nephrosis was produced by repeated subcutaneous injections of uranyl acetate, K chromate and P. Increased fat-cholesterol values were observed in the blood of 5 of 8 rabbits, but they were inconst. and moderate in degree. In no case was there marked albuminuria. Possibly this fact may be correlated with the failure to obtain a distinct increase in lipoids, in view of the theory that in the diseases characterized by cholesterolemia and lipemia there is a decrease in the concn. of proteins (globulins) in the blood. E. M. HUMPHREYS

Studies on the formation of salivary concretions. CARL NAESLUND. *Acta Path. Microbiol. Scand.* **2,** 244–76(1925).—*Actinomyces* were present in all the salivary concretions examd. The concretions were composed of org. substances and salts, chiefly Ca carbonate and phosphate. On cultivating *Actinomyces* in media made from saliva and suitable salts, artificial concretions were obtained, similar to salivary concretions in histological structure and chem. compn. The apparent mechanism underlying the formation of these calculi is a decompn. of proteins by the organism. The alteration of the balance of Ca-protective colloid together with the lessened stability in the more alk. medium brings about a pptn. of Ca. By the repetition of this process and continued growth of *Actinomyces,* calculi are built up. E. M. HUMPHREYS

The rate of urea excretion as a test of renal function by means of a modification of McLean's index. SHOHEI KAWAHARA. *Arch. Internal Med.* **38,** 36–40(1926); cf. *C. A.* **11,** 2096.—Combined with Bahlmann's micro method which requires only 0.4 cc. blood, McLean's test is practicable for clinical purposes, especially as it does not call for a const diet. MARY JACOBSEN

Edema. I. Correlation of elastometer findings, disappearance time of intradermally injected salt solution, urine analysis and nitrogen retention of the blood in edema. MARGARETA M. KUNDE. *Arch. Internal Med.* **38,** 57–68(1926) —In uncomplicated typhoid fever no edema was demonstrable by either of the 2 methods, in spite of the high temp. In acute toxemias of pregnancy the disappearance time was reduced to 10 min., in acute nephritis to 30 min. before edema was detectable by the elastometer. There is no evidence for a causal relation between the decrease of disappearance time on one hand and albumin and casts in urine and N retention on the other. M. J.

External factors causing variable results in the Kottmann reaction. JACOB KASANIN AND EMILY KNAPP. *Arch. Internal Med.* **38,** 129–35(1926).—The Kottmann reaction in a no. of psychotic patients was independent of the emotional state and accelerated rather than retarded by hyperthyroidism. It is essentially influenced by the p_H (CO_2 content of the serum), being considerably accelerated by heating to 45° or prolonged exposure to air at room temp. and retarded by perfusion with CO_2. The reaction is declared to be of no diagnostic value. MARY JACOBSEN

Diseases of the liver. V. A comparative study of tests for hepatic function in certain diseases of the hematopoietic system. C. H. GREENE AND H. M. CONNER. *Arch. Internal Med.* **38,** 167–85(1926); cf. *C A.* **20,** 1449. MARY JACOBSEN

Gastric ulcer. IV. Experimental production of gastric ulcer by local anaphylaxis. P. F SHAPIRO AND A. C. IVY. *Arch. Internal Med.* **38,** 237–58(1926).—Acute gastric ulcers were produced in rabbits and dogs with egg albumin, beef protein, oat protein, squash-seed globulin, edestin, hemoglobin and horse serum, on the basis of local anaphylaxis. Casein, milk and tuberculin gave negative results. Passively immunized animals were equally susceptible. The severity of either the local or the general reaction varied with the species. The severity of the gastric reaction in rabbits was proportional to the precipitin titer of the serum. The serum of sensitized dogs contained no precipitins to animal or plant proteins. MARY JACOBSEN

The unitary nature of impairment of renal function. A. M. FISHBERG. *Arch. Internal Med.* **38,** 259 75(1926).—Impairment of renal function is always characterized by a decrease of the max concn of each individual urine constituent, independently of the underlying anatomical changes. There is a corresponding fall in the d. of the urine, the min. being 1 010. Selective retention (Bright's disease) is caused by prerenal deviation of the retained substance. A modification of Volhard's sp. gr. test may be used for the detection of retention. MARY JACOBSEN

The basal metabolic rate in cases of chronic cardiac disease and in cases of hypertension. SHEPARD SHAPIRO *Arch. Internal Med* **38,** 384-90(1926)—"The basal metabolic rate in patients with organic heart disease is normal. High readings are usually due to dyspnea " MARY JACOBSEN

Antilipoid antibodies. GIUSEPPE SORGE *Biochem. terap sper.* **13,** 192–6(1926).—The serum of rabbits which have been injected with the lipoid fraction of rabbit erythrocytes suspended in hog serum or even with the lipoids alone showed complement deviation with the Wassermann antigen, fractionated erythrocyte exts. and *cholesterol.* Similar results were obtained for other animals. MARY JACOBSEN

Blood chemistry studies in leprosy. I. Non-protein nitrogenous substances, sugar and chloride. E M. PARAS. *Philippine J. Sci.* **30,** 219–34(1926).—The blood compn showed no consistent relation to either duration, extent or type of leprosy or of the treatment applied The Cl content was normal, uric acid, creatinine and sugar were usually somewhat high. Non-protein and urea N were high in cases with nephritis, 45 4 and 24 8, and in those with leprosy reaction, 41.06 and 19.3 mg./ 100 cc. blood MARY JACOBSEN

Physicochemical investigation of isohemagglutination. I. Significance of electrolytes. P. RONA AND H. A. KREBS. *Biochem. Z.* **169,** 266–80(1926).—By *isoagglutination* is understood the fact that sera of certain individuals can agglutinate red blood cells of other individuals The effects of salts such as NaCl, $CaCl_2$ and of the drugs urethan, quinine, eucupine, vucine and optochine upon isoagglutination are tabulated. W. D. L.

Change of properties of the blood of diabetics after long-continued insulin treatment. O. KLEIN *Biochem. Z.* **171,** 177-90(1926)—The blood of diabetics is studied with regard to the following: blood sugar, erythrocytes, serum proteins, dry substance NaCl, and the mol. concn., f. p , surface tension and viscosity of the serum. W. D. L.

Lipolytic power and cholesterol content of blood serum in lues. H. v. WEISS AND M. DÖRLE. *Biochem. Z* **171,** 225–30(1926). W. D. L.

The presence of heparin in normal and hemophilic blood of man. W H. HOWELL. *Am. J. Physiol.* **77,** 680–7(1926).—Hemophilic blood appeared to contain no more heparin than normal blood does. J. F. LYMAN

The pathogenesis of tetany. V. The prevention and control of parathyroid tetany by calcium lactate. L. R. DRAGSTEDT AND A. C. SUDAN. *Am. J. Physiol.* **77,** 296–306(1926); cf. *C. A.* **19,** 116.—After complete thyroparathyroidectomy, dogs can be kept alive and in good condition by the oral administration of Ca lactate. The daily effective dose is least (1.8 to 4.4 g. per kg. body wt.) for adult dogs, larger (6 to 12 g.) for a young dog and still larger during the latter part of pregnancy. Milk was less effective in controlling parathyroid tetany than would be expected if Ca were the only effective constituent. It is suggested that the ameliorating effect of a milk diet in parathyroid tetany is due to its content of lactose rather than to Ca. **VI. The prevention and control of parathyroid tetany by strontium.** *Ibid* 307–13.—Parathyroid tetany in dogs can be relieved by the oral administration of Sr lactate or by the intravenous injection of large amts. of modified Ringer soln. in which $SrCl_2$ has replaced $CaCl_2$ in the usual formula. **VII. The prevention and control of parathyroid tetany by the oral administration of kaolin.** *Ibid* 314–20.—Tetany was controlled and life preserved in thyroparathyroidectomized dogs by feeding daily 50 to 200 g. of kaolin with white bread and corn meal. After kaolin feeding the intestinal organisms changed to the aciduric type It is believed that the effect of kaolin is due to the adsorption of

toxic products of bacterial growth and to the change in type of intestinal organisms which it brings about. VIII. **The effect of guanidine intoxication on the blood calcium of parathyroidectomized dogs.** *Ibid* 321–5.—Guanidine-HCl given subcutaneously to thyroparathyroidectomized dogs produced no marked change in the blood serum Ca, but on several occasions produced severe convulsions. J. F. LYMAN

The absorption of undigested protein. J. P. HETTWER AND R. KRIZ-HETTWER. *Am. J. Physiol.* **78,** 136–49(1926).—When horse serum was placed in the small intestine of guinea pigs that had been sensitized to horse serum, symptoms of anaphylactic shock were observed under certain conditions. It is concluded that min. quantities of whole protein are easily, perhaps normally, absorbed from the intestinal tract. When the intra-intestinal pressure is raised, as by stasis, the absorption of undigested protein may be greatly increased, so as to produce toxic symptoms even in moderately sensitized animals. J F. LYMAN

Changes in body temperature and metabolism accompanying experimental marked diuresis. N. M. KEITH AND MARY WHELAN. *Am. J. Physiol.* **77,** 688–702 (1926).—Rapid water loss induced by the intravenous injection of sucrose or glucose did not produce a rise in body temp. of dogs unless toxic substances also were introduced. During diuresis there is an increase in the total excretion of urea, Cl and Na and at the end of the diuretic period these substances are increased in the blood in consequence of the concn. of the blood With restoration of H_2O, the plasma, urea, Cl and Na return to normal and the excretion of urea in the urine continues, but there is a retention of Na and Cl. J F. LYMAN

The effect of adrenaline and thyroxin on water absorption by brain tissue. J. A. HALDI, JULITTA LARKIN AND PAULINE WRIGHT *Am. J. Physiol* **78,** 74–80(1926).—The effects of thyroxin and adrenaline on the degree of hydration of various portions of the isolated brain suggest that a disfunctioning of the endocrine glands might affect the absorption of water by the brain tissue and, therefore, be a factor in mental disorders. J. F. LYMAN

Renal insufficiency in diabetic coma. L. SALOMONSEN AND M. HARBOE. *Acta Med. Scand.* **63,** 425–30(1926).—Two forms of diabetic coma are distinguished: the usual form with marked formation of ketone bodies, and a rarer form which proceeds without any appreciably increased ketonemia. Renal insufficiency in diabetic coma can prevent the excretion in the urine of acetoacetic acid in spite of an existing hyperketonemia. A diabetic case is presented to illustrate how renal insufficiency may possibly be caused by hyperglucemia. S. MORGULIS

Studies of metabolism in pernicious anemia. GÖSTA BECKER. *Acta Med. Scand.* **63,** 478–521(1926).—The N balance of 8 patients with pernicious anemia was studied over periods of 15–90 days. In most instances the balance was pos., and when a neg. balance was found it usually was assocd. with fever, insufficient nourishment, especially of protein food, or with a sudden reduction in the diet. Only in 2 cases was the possibility present that the neg. N balance may have been due to an increased blood destruction. In 12 basal metabolism expts performed on 7 patients the urinary N was also detd., and the participation of the nitrogenous material in the total daily combustion furnished 9–18.5% (av. 14.8%) of the energy output. The CO_2-combining power of the blood was frequently somewhat reduced, and occasionally somewhat increased. The NH_3 in the daily urine was often rather high, over 1 g. Both these facts would indicate a tendency towards acidosis, but there was no appreciable amt. of acetone bodies in the urine. However, the amino-acid content in half the cases studied was greatly increased. Indican was very frequently present in the urine. The blood sugar and non-protein N were normal The serum Ca was normal, but Na was either normal or sometimes above and sometimes below the normal level, while the Cl content was increased. The serum K was frequently very much increased, which is assocd. with the destruction of red cells. The connection between the high serum K and blood destruction is further borne out by the increased bilirubin content of the blood. The patients often showed a high respiratory quotient. S. MORGULIS

The thyreotoxicosis syndrome and the reaction with small iodine doses. JOHANNES WAHLBERG. *Acta Med. Scand.*, Suppl. XIV, 148 pp.(1926).—The thyreotoxicosis syndrome is characterized by the common occurrence of a disturbance in thyroid function as is evinced not only from a general clinical investigation but also from a study of the basal metabolism, of the alimentary glucemic reaction and of the blood pressure. In 20 such patients expts. were carried out to det. the effect of small doses of I_2 on the clinical condition as well as on the basal metabolism, pulse rate and body wt., the results showing that these patients betray a characteristic sensitiveness toward the I_2. The primary effect is a general improvement which occurs the more quickly and is

the more pronounced, the more intense the thyreotoxicosis syndrome, and which involves the entire syndrome (lowering of the basal metabolism up to 60%, reduction of pulse rate by upward of 40 beats per min., recession of the exophthalmus, cessation of diarrhea, etc.). By continued treatment this primary effect of the I_2 is followed by a secondary exacerbation of the syndrome which is quicker in its onset and more pronounced the more serious the patients' condition was. The condition of a patient may, therefore, actually become much worse under the I_2 treatment. At the discontinuance of the treatment the condition also becomes much worse, this being the more pronounced the more serious the thyreotoxicosis of the patient was at the beginning of the treatment. The I_2-therapeusis must, therefore, be regarded as offering merely a palliative relief, unless it is resorted to as a preoperative and postoperative treatment, and as a method of therapy should be carefully avoided, especially in the more advanced stages of the disease. S. MORGULIS

The ketone bodies of the blood. EMERICH V. FAZEKAS. *Biochem. Z.* **170,** 224-9 (1926).—No relationship has been found between the concn. of acetone bodies in blood and urine. In oxalated blood the largest amt. of acetone bodies was present in the corpuscles, but if the plasma is sepd. from the cells without any anticoagulant the acetone content of the blood cells is minimal except in the diabetic coma condition. It has also been noted that an injection of insulin in diabetic coma causes a very great fall in the β-hydroxybutyric acid even before there is a definite change in the blood acetone or sugar. This is not the case when insulin is administered in a non-coma state, the β-hydroxybutyric and acetone concns. diminishing proportionally. Insulin frequently influences much more the acetonuria than the glucosuria, and this may be due to the fact that it directly aids the oxidation of acetone bodies. S. MORGULIS

The presence of amino acids in the gall from a bile duct cyst. TOMOHIRO TAKAKI. *J. Biochem.* (Japan) **6,** 27-9(1926).—A large quantity of bile (1500 cc.) obtained from a spontaneous cyst of the bile duct in a 1-year old child after proper analytical treatment yielded 0.03 g. tyrosine, 0.43 g. leucine, 0.18 g. arginine and 0.06 g. lysine (the last 2 as the picrate). S. MORGULIS

A discussion of recent studies on the metabolism of normal and malignant cells. J. A. HAWKINS. *J. Gen. Physiol.* **9,** 771-9(1926).—The glucolytic activity of a tissue is probably a function of its growth rate. In most instances malignant tissues which have a more rapid growth rate than normal tissues fall in a group by themselves and are approached in resemblance only by young embryonic tissues. From this activity a classification of tissues may be made that corresponds much more closely with their biol. groupings than one based upon the aerobic glucolysis-respiration ratio of Warburg (*C. A.* **19,** 1159, 1720, 2369, 2370, 2702). C. H. R.

Suppression of shock and modification of anaphylactic sensitization by certain fluorescent colors. Colloidal mechanism. PIERRE GIRARD AND EDOUARD PEYRE. *Compt. rend.* **183,** 84-6(1926).—The intravenous injection of Cs eosinate or of Cs erythrosinate protects against either direct shock from certain drugs, or against anaphylactic shock in an animal sensitized to horse serum. L. W. RIGGS

Cause of the hyperglucemia appearing in guinea pigs in acute anaphylactic shock. JEAN LA BARRE. *Arch. exptl. Path. Pharm.* **113,** 368-82(1926).—Neither adrenalectomy nor ergotamine paralysis of the sympathetic nerve app. of the liver prevents the development of symptoms of shock, indicating that the hyperglucemia is not due to an increase in the adrenaline content of the blood and liver. The hyperglucemia is the result of a rapid glycogenolysis in the liver, since if the primary circulation of the liver is interrupted by ligation of the portal vein or if the liver is rendered poor in glycogen by hunger or phlorhizin intoxication, shock hyperglucemia does not develop. The glycogenolysis in the liver is itself a result of a stimulation of the vagus end app. of the liver by the anaphylactic process. The vagus centers are not involved since bilateral vagotomy is without effect. On the contrary, the paralysis of the vagus endings by atropine interferes with the disappearance of glycogen from the liver, as well as with the hyperglucemia. G. H. S.

Biological Therapy. London: Parke, Davis & Co. 198 pp. Reviewed in *J. State Med.* **34,** 495(1926).

KAMINER, GISA: **Die Biochemie des Karzinomas.** Vienna: Julius Springer. 52 pp. M. 3.50.

H—PHARMACOLOGY

E. K. MARSHALL, JR.

Action of alcohol on the circulation of man and of animals. HIROSHI TAKAHASHI

Tohoku J. Exptl. Med. **7**, 169–96(1926).—The application of concd. alc. to the mucous membrane of the mouth of man or animals is immediately followed by increased blood pressure and a diminution of the pulse rate. These changes last only a few min. The alc. irritates the sensory nerves of the mucous membrane and thereby acts as a reflexive vasoconstrictor. Diminution of the pulse rate is caused by the raised vagustonus in consequence of the increased blood pressure. When 50% alc. is taken into the stomach the same changes in blood pressure and pulse rate are observed, but the return of each to normal is gradual. A similar action occurs when alc. is given subcutaneously or by rectum. Intravenous injection of 1 cc. of 50% alc. in the rabbit causes an increase of blood pressure followed by a fall, but the pressure remains above normal for more than 60 min. Intravenous injection of 5 cc. of 50% alc per kg. causes a sharp drop in blood pressure followed first by a rise above the normal pressure, and after 10 min. a fall below the normal pressure Intravenous injection of concd alc. in animals causes a rise in blood pressure, resorptive action, but upon the fact that concd. alc. through its action on the properties leads to vasoconstriction and may also cause heart injury. The clinical use of alc. is discussed L. W. RIGGS

New researches on the effect of sulfur, sulfides, and sulfuretted mineral waters on respiration. PIÉRY, BONNAMOUR AND MILHAUD. *Compt. rend. soc. biol.* **94**, 69–71 (1926).—Intravenous injection of colloidal S, sulfuretted mineral water and 0.05% NaHS causes marked vasodilation in the region of the lung, congestion and edema, augmentation of amplitude of rhythm of respiration which is more pronounced in expiration, and an inconstant and imperfect retardation of rhythm. The effect begins a little after the beginning and ends a little before the end of the injection. It is not a toxic action because 5 cc. of 0.05% NaHS (toxic dose) causes at first an augmentation of the amplitude with a more and more marked retardation and finally a cessation of respiration with convulsions intervening at the same time. The intensity of the symptoms varies, for the same doses, with the rate of injection. Marked depression of the carotid pressure accompanies the respiratory reaction as well as an abundant exhalation of H_2S This is evidence of the essential role of this gas in respiratory disorders. S compounds which cannot evolve H_2S on account of their nature have no effect on the respiration, although they are not without biol. action. 0.5 5% $Na_2S_2O_3$ causes no respiratory trouble, no carotid depression, no evolution of H_2S. M. BEBER

The effects of radiation on calcium and phosphorus. H. S. MAYERSON, L. GUNTHER AND H. LAURENS. *Proc. Soc. Exptl. Biol. Med.* **22**, 469–70(1925).—Normal dogs on a standard maintenance diet were exposed to the radiations of a 25-amp. flaming arc with a spectal energy distribution of approx. 50% ultra-violet, 11% visible and 39% infra-red. Normally a slight rise in serum P is accompanied by a similar decrease in serum Ca, and *vice versa.* Radiation of 1 hr. at 40 cm. for 8 days caused a marked increase in P and a corresponding decrease in Ca. C. V. B.

Physiological action of carnosine. J. T. MCCLINTOCK AND H. M. HINES. *Proc. Soc. Exptl. Biol.* **22**, 515–6(1925).—Subcutaneous injection of 2 g. in an 11-kg. dog caused vomiting, diarrhea and severe toxic shock. Intravenous injections in a cat caused similar symptoms and a marked fall in blood pressure. The general systemic effect was similar to that of histamine but larger doses were required. C. V. B.

The action of strophanthus on the chloralized heart. S. D'IRSAY. *Proc. Soc. Exptl. Biol. Med.* **22**, 530–3(1925).—The action of a digitalis body is purely myotropic. It has a similar effect on the cold-blooded heart, denervated by chloral hydrate, as it has on the normal organ. C. V. B.

Effects of cholesterol on smooth muscle of intestine and uterus. C. H. THIENES. *Proc. Soc. Exptl. Biol. Med.* **22**, 539–41(1925).—Cholesterol in concn. of 1–5,000,000 in Tyrode soln. increased the activity of immersed strips of the intestine and uterus of the cat and rabbit. The effect was due to increased contractility of the muscle substance independent of nerve endings and ganglia. C. V. B.

The tolerance of normal and phlorhizinized dogs for acetoacetic acid. T. E. FRIEDEMANN, M. SOMOGYI AND P. K. WEBB. *Proc. Soc. Exptl. Biol. Med.* **23**, 74(1925).—In normal dogs acetoacetic acid completely disappears when it is injected intravenously at the rate of 5 to 6 millimols. per kg. of body wt. per hr. A small portion is excreted as β-hydroxybutyric acid and acetoacetic acid in the urine and as acetone in the exhaled air. Long-continued phlorhizination and starvation decrease the tolerance 30 to 50%. In such animals, insulin increased the tolerance to normal in about 3 hrs. C. V. B.

Experimental studies with Møllgaard sanocrysin. HELLMUTH DEIST. *Beitr. Klin. Tuberk.* **62**, 658–64(1925).—Exptl. studies on rabbits with Møllgaard's sanocrysin in animals infected with bovine tubercle bacilli, and in which the treatment was given

according to the method outlined by Møllgaard, gave only neg. results and led to the conclusions that sanocrysin is to be classed with the irritant type of treatments previously demonstrated with other Au compds. It is believed that the Au therapy in addn. to being valueless has an injurious affect upon the tissues of the animal. H. J. CORPER

The treatment of pulmonary tuberculosis by sanocrysin. BRICE RICHARD CLARKE. *Tubercle* **7,** 478, 534–40, 584–95(1926).—Not suitable for abstracting. H. J. C.

Action of adrenaline chloride on the respiratory center. L. B. NICE AND ALMA J. NEILL. *Univ. of Oklahoma Bull.* **4,** Univ. Studies No. 21, 20–1(1925). E. J. C.

The gold treatment of tuberculosis. F. R. GREENBAUM. *Am. J. Pharm.* **98,** 471–5(1926).—A review of published work dealing with Au prepns. and their effect as a remedy for tuberculosis. A bibliography of 15 references is appended. W. G. G.

Trypanocidal action of antimony. S. RAMON AND R. SCHNITZER. *Arch. Schiffs-Tropen Hyg* **28,** 471–9(1924). H. G.

Experimental studies on the treatment of malaria. J. MORGENROTH, L. ABRAHAM AND R. SCHNITZER. *Deut. med Wochschr.* **52,** 1455–7(1926).—The antimalarial activities of quinine, hydroquinine and optochine increase in the order named. A. G.

The effect of oxygen inhalation on the blood sugar. W. HEUBNER. *Deut. med. Wochschr.* **52,** 1508–9(1926).—A criticism of the work of Jacoby (*C. A.* **20,** 3038). Reply. H. JACOBY. *Ibid.* A. GROLLMAN

The usefulness of metallic therapy in infectious diseases. K. v. NEERGAARD. *Deut med. Wochschr.* **52,** 1509–12(1926).—A review, with references, of the therapeutic use of metals in colloidal soln ARTHUR GROLLMAN

The effect of orally administered hydrochloric acid upon the gastric contents in normal individuals and in patients with achlorhydria. R. A. KERN, EDWARD ROSE AND J. H. AUSTIN. *J. Clin. Investigation* **2,** 545–77(1926).—The p_H of the gastric content in achlorhydria ranges from 3.0 to 7.0. In primary pernicious anemia, it was 5.5 or higher. Administration of small doses of HCl did not produce any material change in the p_H of the stomach contents. Larger doses of 4 to 8 cc. of dil HCl were found to be practicable and effective in influencing the depressed peptic activity due to the hypoacidity The presence of trypsin in the fasting content of the stomach in achlorhydria points to duodenal regurgitation as a const. phenomenon in this condition. ARTHUR GROLLMAN

Mechanism of the action of iodides on the nitrogen metabolism. G. P. GRABFIELD, C. GRAY AND B. FLOWER. *J. Clin. Investigation (Proc.)* **2,** 605(1926).—After thyroidectomy, the injection of iodides does not cause an increase in the N excretion as it does in normal animals. ARTHUR GROLLMAN

The action of parathyroid upon calcium and lead in the bones. DONALD HUNTER AND J C AUB. *J. Clin. Investigation (Proc.)* **2,** 605(1926).—Parathyroid injected into patients with Pb poisoning caused an increased rate in the elimination of the Pb from the body. ARTHUR GROLLMAN

Oxygen poisoning. C. A. L. BINGER, J. M. FAULKNER AND R. L. MOORE. *J. Clin. Investigation (Proc)* **2,** 610(1926)—Mice, guinea pigs, rabbits and dogs all succumb to the effects of O_2 in concns. of 80% or over, in about 5 days. The characteristic pulmonary lesion is capillary dilatation and hemorrhagic edema. A. G.

The nephrotoxic action of ingested cystine. A. C. CURTIS AND L. H. NEWBURGH. *J. Clin. Investigation (Proc.)* **2,** 611(1926)—Cystine when ingested by rats causes a hemorrhagic nephropathy and death within a few days. Doses several times the min. dietary requirement caused moderate renal injury in the course of several months. Moderate over-doses, inhibit growth; large doses produce a loss in wt. A. G

Diminution of alimentary hyperglucemia, in dogs, by the peroral administration of extracts of bilberry leaves. ROBERT E. MARK AND R. J. WAGNER. *Klin. Wochschr.* **4,** 1692–3(1925).—Properly prepd. exts. of bilberry leaves contain a substance that will diminish alimentary hyperglucemia in dogs. Method of extn. is not given. The substance is effective only when large quantities of the ext. are administered perorally. MILTON HANKE.

Is the action of adrenaline on blood pressure and blood sugar a dissociated action? GYULA FÖRSTER AND Z. BENKOVICS. *Z. ges. exptl. Med.* **49,** 1–8(1926).—The subcutaneous injection of adrenaline causes a rise in blood sugar content in the same individuals in which an intravenous injection of adrenaline causes a rise of blood pressure, though there is no parallelism between the 2 effects of adrenaline. There is, however, no dissocn. in the 2 effects of adrenaline as has been claimed. H. F. H.

The influence of insulin on basal metabolism. M. REISS AND R. WEISS. *Z. ges. exptl. Med.* **49,** 276–93(1926)—In deep narcosis intravenously injected insulin causes

no increase of basal metabolism. In light narcosis large doses increase the production of heat. In all cases there was an increase in respiratory quotient to be explained by an increased combustion of carbohydrates. HARRIET F. HOLMES

The resorption of calcium diuretin and its effect on the composition of the urine in a healthy individual. E. LEUBE. *Z. ges. exptl. Med.* **49**, 480–6(1926).—Ca diuretin, though much less sol. in H_2O than diuretin, is absorbed in about the same degree when given by mouth. The diuretic action in a healthy individual consists in an increased elimination of NaCl and H_2O in the first hrs., though the elimination of both NaCl and H_2O for a 24-hr. period is little altered. The insensible perspiration is also greatly increased during the first hrs. but not for the 24-hr. period. HARRIET F. HOLMES

The effect of injection of saponin of Primula elatior on the cholesterol content of rabbit serum. V. KOLLERT AND H. GRILL. *Z. ges. exptl. Med.* **49**, 522–4(1926).—Intravenous injection of elatior saponin in rabbits causes a hypercholesterolemia for about 8–12 days, followed by a hypocholesterolemia. At the time of the hypercholesterolemia there is an increased excretion of cholesterol through the bile and a lessened excretion of cholesterol when the cholesterol content of the serum is at a min. HARRIET F. HOLMES

The action of choline, pilocarpine and ergotamine on blood sugar in normal and splanchnicotomized rabbits. B. FARBER. *Z. ges. exptl. Med.* **49**, 525–37(1926).—Subcutaneous injection into rabbit of large doses of pilocarpine caused a hyperglucemia not inhibited by splanchnicotomy. Choline produces the same effect to a less degree Ergotamine causes hyperglucemia in the normal rabbit, and hypoglucemia after splanchnicotomy. The hyperglucemia after larger doses of parasympathetic toxins may be referred to their toxic action on the liver cells, causing a mobilization of glycogen. Small doses may cause a hypoglucemia through vagus action. H. F. H.

The action of adrenaline introduced into the stomach. ISTVAN WEISS AND G. BAITZ. *Z. ges. exptl. Med.* **49**, 543–6(1926).—Adrenaline given by mouth causes no rise of blood pressure, not even when the stomach contains no free HCl. The action of adrenaline given subcutaneously or intravenously cannot be compared with the action of adrenaline given by mouth. HARRIET F. HOLMES

Persistent premature contractions. A clinical study. H. L. OTTO AND HARRY GOLD. *Arch. Internal Med.* **38**, 186–205(1926).—The no. of premature cardiac contractions was not influenced by rest or *atropine*, it was increased by exercise and *adrenaline* and reduced by *quinine (I)*, *quinidine (II)* and *digitalis (III)*. While *I* and *II* are only of limited applicability, *III* always produced a considerable reduction or complete abolition. MARY JACOBSEN

The effect of atropine on gastric function in man. A quantitative study. C. S. KEEFER AND A. L. BLOOMFIELD. *Arch. Internal Med.* **38**, 303–20(1926).—After the hypodermic injection of 2 mg. atropine, a dose sufficient to cause clinical symptoms, 50 cc. of 7% alc. caused gastric secretion, even if the fasting secretion had ceased. The total vol. was as a rule diminished, the decrease beginning about 10 min. after the onset of the secretion, which essentially changes the curve. The degree of titratable acidity is also reduced but not proportionately to the decrease in vol. There is no definite effect on gastric motility. MARY JACOBSEN

The pharmacology and therapeutics of novasurol. A. M. SERBY. *Arch. Internal Med.* **38**, 374–84(1926). MARY JACOBSEN

Acute cocaine poisoning and its treatment in the monkey (Macacus rhesus). A. L. TATUM AND K. H. COLLINS. *Arch. Internal Med.* **38**, 405–9(1926); cf. *C. A.* **20**, 458.—*Na barbital* with *paraldehyde* given intravenously combats the severe symptoms of acute cocaine poisoning in the rabbit, dog and monkey so as to permit a subsequent complete detoxication by the organism. Cortical stimulation must be controlled by sufficient doses lest failure of the medullary centers occur. Man is probably more susceptible to this treatment. MARY JACOBSEN

Adsorption of poisons on charcoal. III. The distribution of poisons between stomach and intestine wall and charcoal. ELIZABETH DINGEMANSE AND E. LAQUER. *Biochem. Z.* **169**, 235–44(1926); cf. *C. A.* **20**, 1132.—The distribution of $HgCl_2$ and strychnine nitrate between the pig stomach and intestine and super-norit, and Merck's charcoal shows that with 55 min. of shaking, 47% of the $HgCl_2$ is adsorbed from the stomach while practically all is adsorbed from the intestine by the charcoal, and that similar adsorption of strychnine occurs. W. D. L.

Influence of insulin upon the urine C : N quotient in rabbits. H. WADA. *Biochem. Z.* **171**, 218–24(1926).—Insulin has no influence upon the excretion of desoxidizable C (*i. e.*, C from compds. other than sugars) in the urine of rabbits. W. D. L.

Influence of insulin upon the excretion of urine by the normal organism. J. A.

COLLAZO AND M. DOBREFF. *Biochem. Z.* **171,** 436-42(1926).—Injection of insulin into man or dog causes an increase in the urine vol. W. D. L.

Unsuccessful experiments with mercurochrome as a biliary antiseptic. IX. Experimental typhoid-paratyphoid carriers. K. F. MEYER, H. SOMMER AND B. EDDIE. *J. Infectious Diseases* **38,** 469-85(1926).—Although rabbits injected intravenously with mercurochrome excrete bile that contains mercurochrome in sufficient quantity to destroy 10,000,000 typhoid bacilli in 6-24 hrs, it was found impossible to cure experimentally produced gall-bladder carriers among rabbits by giving mercurochrome intravenously or by mouth. It is believed that the proteins of bile and possibly the p_H of bile interfere with the bactericidal action of mercurochrome in bile. J. H. L.

The effects of caffeine and theobromine upon the formation and excretion of uric acid. G. W. CLARK AND A. A DE LORIMIER. *Am. J. Physiol.* **77,** 491-502(1926).—After the ingestion of caffeine or of theobromine by man there is an increased concn. of uric acid in the blood. Uric-acid production, measured by urinary excretion and blood concn., seems to be increased after caffeine, but not after theobromine ingestion. The increases of uric acid noted are probably not due to the direct oxidation of the methylated xanthines, else theobromine, rather than caffeine, would give the greater increase. Prolonged administration of either caffeine or theobromine seemed to depress active excretion by the kidney. J. F. LYMAN

The effect of insulin on the respiratory exchange of decerebrate and decapitate cats. A. C. TAYLOR AND J. M. D. OLMSTEAD. *Am J. Physiol.* **78,** 17-27(1926).—Insulin caused a definite rise in the respiratory quotient in the decapitate cat Total cals. produced remained at the same general level after insulin as before; but the cals. due to carbohydrate combustion rose from zero or a low level, until in 5 out of 8 cases it accounted for all the energy output just before the time of convulsion J. F. L.

Insulin and respiratory exchange in frogs during muscular exercise and after injection of insulin. J. M. D OLMSTED AND J. M. HARVEY. *Am. J. Physiol.* **78,** 28-33(1926).—In the winter frog kept in the lab. at room temp insulin depressed the general metabolic rate and changed the metabolism from fat to carbohydrate oxidation. If convulsions occurred, fluctuations in the respiratory quotient, similar to those seen in normal frogs after exercise, were noted J. F. LYMAN

The physiology of gastric secretion. XI. The effect of ethylene anesthesia on gastric secretion and motility. R L. JOHNSTON AND A. C. IVY. *Am J. Physiol.* **78,** 104-9(1926); cf. *C. A.* **19,** 674. Ethylene anesthesia depressed gastric secretion less than did ether. Emptying of the stomach was delayed as a result of amotility and possibly of some pylorospasm. J. F. LYMAN

The action of pituitary extract upon the pregnant uterus of the rabbit. H. H KNAUS. *J. Physiol.* **61,** 383-97(1926) —Parturition could be induced in rabbits by pituitary ext. injected on the 29th to 32nd days of pregnancy. Previous to the 29th day the muscle cells of the uterine wall are probably too underdeveloped to expel the fetus in response to pituitary ext. There is probably no change in irritability or sensitivity of the uterus. J F. LYMAN

The influence of calcium on the isometric response of the frog heart. D. E. DESEÖ. *J. Physiol.* **61,** 484-8(1926).—Varying the Ca content of Ringer soln., being perfused through an isolated frog heart, increased diastolic pressure in all cases. In fatigued hearts or in fresh hearts beating feebly, excess Ca increased systolic pressure; but in fresh hearts beating vigorously excess Ca produced no change in systolic pressure. Excess Ca produced less effect in a neutral soln. (p_H 7.0) than in an alk soln. (p_H 7.8). Ca deficiency produced no certain effect on diastolic pressure, but caused a great decrease in the diastolic pressure. J. F. LYMAN

The effect of glyceraldehyde and dihydroxyacetone on insulin hypoglucemia. H. G. REEVES AND J. A. HEWITT. Proc. Physiol. Soc., *J. Physiol.* **61,** xxxv(1926).—Insulin hypoglucemia (judged by typical symptoms) was relieved by dihydroxyacetone but not by glyceraldehyde F. J. LYMAN

Effect of arsphenamine on the blood sugar curve. KARL HEDEN. *Acta Med. Scand.* **64,** 1-5(1926).—Injections of arsphenamine cause a fall in the blood sugar curve. The blood sugar rises if the arsphenamine is given in concd. lactose soln. S. MORGULIS

Acidosis therapy in coli-infections in the urinary tract. A. HECHT JOHANSEN AND E. J. WARBURG. *Acta Med. Scand.* **64,** 91-112(1926).—*In vitro* expts. established the fact that highly acid media (p_H 5) inhibit the growth of *B. coli.* It has also been demonstrated that the antiseptic action of hexamethylenetetramine is exercised only in an acid medium. Acidosis therapy, by means of $CaCl_2$ or NH_4Cl, resulted in a perfect cure of 57% of the treated cases of coli-pyuria, while in 30% of cases the symp-

toms were cleared up though they were not rendered bacteria-free. In the remaining 13% of the cases the treatment had no effect. S. MORGULIS

Studies of the influence of ordinary narcotics of the alcohol group on the smooth muscles of the leech and of the isolated intestine. BIRGER CARLSTRÖM. *Skand. Arch. Physiol.* **48,** 8–54(1926).—C. maintains that the smooth muscles of the leech contain ganglia and that they cannot be made atonic by denervation. The spontaneous contraction and alteration of irritability of the muscle prepns. appear under the influence of various narcotics later than the changes in tonus. This is attributed to the fact that nerve elements richer in lipoids are more sensitive and respond more quickly to the narcotics. $CHCl_3$ in ordinary concns. causes at first tonus increase followed soon by a loss of tonus, but during this phase the muscle irritability increases. The loss of irritability sets in much later. This indicates that tonus alterations caused by narcotic poisons of the alc. series must be assocd. with a paralysis of a nervous mechanism for tonus regulation. The effect on the isolated intestine of alc. and of other narcotic poisons (3% concn.) is to paralyze the pendulum movements and the tonus, after a preliminary strong increase, diminishes very rapidly. In smaller concns. (1–2%) the pendulum movements do not cease entirely but are reduced in amplitude, the tonus of the intestine decreasing at the same time. The latter process takes place very slowly under the influence of CCl_3 CHO. EtOH does not act so strongly on the musculature as the CCl_3.CHO does and therefore does not tend to produce the strong slow contractions as the latter As further evidence of the smaller stimulating influence of alc., the initial impulse given by EtOH is much weaker than that given by CCl_3.CHO. Under the influence of dil. alc. (± 0.5%) the pendulum movements are somewhat strengthened, but an increase in tonus has not been observed under those conditions of the expt. S MORGULIS

Investigation of the simultaneous influence of insulin and various drugs on tissue oxidation. SVEND AAGE HOLBØLL. *Skand. Arch. Physiol.* **48,** 225–30(1926).—Insulin in concn. insufficient in itself to affect the rate of tissue oxidation inhibits the accelerating influence of alkaloids. Thus, insulin inhibits the stimulating action of atropine regardless of the order in which these are added to the system. With ergotamine the addn. of the insulin not merely interferes with the accelerating action of the drug but actually causes complete inhibition of the oxidative activity. In expts. with cocaine the acceleration is unaffected when the alkaloid is added before the insulin, but not if the insulin is added first. Essentially the same result was obtained with pilocarpine. In expts. where glucose was added to the system besides the insulin and alkaloid the usually occurring great acceleration of tissue respiration is inhibited by the alkaloid. The results of these expts. indicate an antagonistic influence of insulin and of the studied alkaloids on tissue respiration. S. MORGULIS

The influence of the cations of Ringer solution on the smooth muscles of the guinea pig uterus. M. KOCHMANN. *Biochem. Z.* **170,** 230–5(1926); cf. *C. A.* **20,** 1276.—By means of a system of coordinates along 3 axes, each representing the concn. of NaCl, KCl or $CaCl_2$ necessary to secure complete isotony, the effect upon the uterus is plotted for various combinations of these 3 salts, and makes possible the prediction of behavior for any kind of combination. S. MORGULIS

A study of the effect of moderate doses of alcohol on the growth and behavior of the rat. C. P. RICHTER. *J. Exptl. Zool.* **44,** 397–418(1926).—The white rat is able to utilize 8–16% EtOH soln. as a steady fluid supply, replacing isodynamic quantities of food without intoxication or habit formation, but with a decrease in spontaneous activity. The ability of the rat to ingest large amts. of EtOH without harm is due to its high rate of metabolism. On the basis of energy requirement and energy intake, man and the rat can take approx. the same quantity of EtOH without intoxication. Rats on an EtOH diet ate 16.9–35.6% less food, but grew and reached the same body wt. at maturity as the controls. EtOH in the rat replaces isodynamic quantities of food in maintaining energy, and is also used for growth and development. C. H. R.

Medicinal aspects of tobacco. H. ROLLESTON. *Lancet* **1926,** I, 961–5.—A general review is given of the literature and history of tobacco smoking. The effects of cigaret smoking are due chiefly to CO, pyridine, furfurol and NH_3, whereas cigar smoke is powerful mainly on account of its nicotine content. Tobacco smoking is not really an addiction. It has a use as a sedative. The bad effects of tobacco smoking on the nervous system and on the heart and circulation and on mental efficiency are described. F. B. SEIBERT

Strength of digitalis preparations. II. Accuracy of digitalis evaluation in cats. C. DE LIND VAN WIJNGAARDEN. *Arch. exptl. Path. Pharm.* **113,** 40–58(1926).—Analysis of the results of 573 detns. showed the av. error of a single detn. to be 13%. In 95%

of the detns. the value found differed from the true value by less than 10%. **III. Preservation of powdered digitalis leaves.** *Ibid* 59–65.—Fresh undried digitalis leaves can show a very considerable loss in strength during the first days after harvesting. There may be a 4-fold loss in the activity of pulverized digitalis leaves. The best temp. for drying is 55–65°. Such a powder may remain of unchanged potency for a year. After drying at 85° and above, a more or less prompt fall in activity occurs. Leaves dried at 15–30° may show an increase in strength after long preservation. Digitalis and strophanthine tinctures retain their strength almost unchanged for at least 1 yr. if kept in a cellar. G. H. S.

Effects of cholesterol. I. Effect of cholesterol on the action of insulin. HERMANN LANGE AND RUDOLF SCHOEN. *Arch. exptl. Path. Pharm.* **113,** 92–101(1926).—By the addn. of cholesterol in suspension or emulsion to insulin there occurs in mice a definite delay in the onset of insulin action. This is due to retarded resorption. The insulin is adsorbed to the cholesterol. Preliminary treatment of mice with large doses of cholesterol (fed or injected subcutaneously) increases the resistance to insulin. G. H. S.

Antagonistic effect of trichloroisobutyl and trichloroisopropyl alcohols upon apomorphine vomiting. HANS MOLITOR. *Arch exptl. Path. Pharm.* **113,** 102–112(1926).—Dogs do not develop a tolerance to apomorphine when small doses are regularly given. Chloretone is definitely antagonistic to apomorphine vomiting, isopral less so. While the antiemetic action of chloretone is not increased by caffeine, with isopral this is the case with large doses. G. H. S.

Evaluation by hypophysis extracts by means of the guinea pig uterus. KONRAD FROMHERZ. *Arch. exptl. Path. Pharm.* **113,** 113–23(1926).—A discussion of method and sources of error. G. H. S.

Antagonistic action of pituitrin and insulin on diuresis. OSKAR KOREF AND HANS MAUTNER. *Arch. exptl. Path. Pharm.* **113,** 124–8(1926).—Since there is no change in pituitrin inhibition when pituitrin and insulin are injected simultaneously there can be no direct antagonistic action between the 2 substances. The effect of insulin is abolished only when a hypoglucemia is established, but whether this hypoglucemia is direct or indirect or due to some other still unknown action of insulin is not clear. Since up to the present a direct effect of insulin on the kidney is not known, it is probable that the point of attack is extrarenal. G. H. S.

Exclusion of the vegetative nervous system from the circulation. III. Studies of the vessels. G. GANTER. *Arch. exptl. Path. Pharm.* **113,** 129–50(1926).—Gynergen (ergotamine tartrate) renders the arteries of the systemic circulation insusceptible to physiol. stimulation of the sympathetic. Small doses frequently cause a loss in arterial tonus, while large doses cause an increase, the latter effect being referable to the effect of gynergen on the muscle. Cerebral asphyxia caused by compression of the arteries leading to the brain leads to a considerable constriction of the arteries of the systemic circulation and frequently to an increase in blood pressure. After gynergen this constriction does not occur, and bradycardia is outspoken. After exclusion of the parasympathetics, as by means of atropine, the effect of central vagus stimulation by asphyxia is diminished. Gynergen also prevents the vasoconstriction due to asphyxia following tracheal compression; indeed, there is a vaso-dilatation, apparently due to a peripheral action of acid on the vessel wall. After gynergen the admixt. of CO_2 with the respired air causes vasodilation. If atropine is given with gynergen practically the entire vegetative nervous system is excluded. G. H. S.

Effect of insulin and pituitrin on the water economy. OSKAR KOREF AND HANS MAUTNER. *Arch. exptl. Path. Pharm.* **113,** 151–62(1926).—Water, milk, 1% NaCl, 3 or 8% $MgSO_4$, or 5% alc. given by mouth 2 hrs. after a subcutaneous injection of insulin are absorbed from the digestive tract of rats to a definitely greater degree than in control animals. After subcutaneous injection of NaI the stomach contents of the insulin animal show a weaker I reaction than does the control. One hour after the injection of 0.1–0.3 cc. of pituitrin and the simultaneous oral administration of the above-mentioned substances, the stomach, apparently because of pyloric constriction, and the intestine are more nearly filled than is the digestive tract of the control. G. H. S.

Increase in resorption due to insulin. OSKAR KOREF AND HANS MAUTNER. *Arch. exptl. Path. Pharm.* **113,** 163–70(1926).—See *C. A.* **20,** 1464. G. H. S.

Chronic alcoholic intoxication. E. KEESER AND I. KEESER. *Arch. exptl. Path. Pharm.* **113,** 188–200(1926).—In many cases of chronic alcoholism the relative percentages of the blood proteins remain normal but in other cases the so-called fibrinogen fraction is increased. In delirium tremens there is often a marked relative increase

in albumin, as well as in indican. In some cases the amt. of bile pigments in the blood is increased. A marked ketonemia, the result of a disturbed fatty acid metabolism, is characteristic of alc. intoxication. There is practically no disturbance of carbohydrate metabolism; no hyperglucemia or glucosuria. The phosphatide, soap and total cholesterol values are reduced with a relative increase in cholesterol esters.
G. H S.

Increased activity upon the eye of atropine sulfate, physostigmine salicylate, and pilocarpine chloride caused by the addition of sodium bicarbonate to solutions of these alkaloid salts. KLAAS DIERKS. *Arch. exptl. Path. Pharm.* **113,** 216–23(1926).—Analogous to the behavior of local anesthetics, the addn. of $NaHCO_3$ increases the activity of salts of atropine, physostigmine, and pilocarpine. Not only are solns., otherwise inert, rendered active, but the period of activity is greatly prolonged.
G H. S.

Cause of the antiseptic property of mercury salts. E. KEESER. *Arch. exptl. Path. Pharm.* **113,** 224–31(1926).—The antiseptic action and the absorption by yeast of Hg salts (Cl_2, Br_2, $(CN)_2$, and $(NO_3)_2$) parallel each other. Detns. of surface tension, refraction indices, cond., and cataphoresis show that $HgCl_2$ in low concns. of alc. is dissolved as alcoholate. Just as the antiseptic activity of Hg salts is increased by the addn. of acids or acid salts, since the effect of the H ions on the cell protoplasm is added to that of the Hg ions, so also the increased antiseptic activity of Hg salts in aq. solns. with 20–30% of alc. depends upon the added effect upon the cell colloids of the Hg ions and the alc. G. H. S.

Pharmacology of germanium compounds. I. KEESER. *Arch. exptl. Path Pharm.* **113,** 232–6(1926).—Solns. of GeO_2 up to concns. of 1:1000 can be obtained in distd. water, Ringer, and physiol. NaCl soln. More highly concd. prepns. are not true solns. and tend to the development of an unstable colloidal state. The Na salt of Ge tartrate is sufficiently sol. in water to afford suitable material for injection. Injected subcutaneously in rabbits, 2–10 mg. of Ge per kg. is without effect, but 15 mg. per kg (as GeO_2) causes an increase in erythrocytes, while 30 mg. increases for several days the no. of red blood cells by 1.9 million and the hemoglobin by 35%. Nevertheless, compds of Ge are less active than corresponding compds. of As. Subcutaneous injections of 30, 40, 60 and 90 mg. of Na Ge tartrate per kg. do not increase the red blood cell count or the hemoglobin Neither the total no. nor types of white cells present are changed. Injected intravenously, 75 mg. of Na Ge tartrate has no effect on heart activity, blood pressure or respiration. Supersatd. colloidal solns. of GeO_2 given intravenously cause immediate collapse with cardiac arrest. G. H. S.

Antithyreoidin-Moebius. OTTO GESSNER. *Arch exptl. Path. Pharm.* **113,** 237–45 (1926)—Antithyreoidin-Moebius very considerably inhibits the metamorphosis of amphibia larvae when induced artificially by thyroid feeding, as well as spontaneous metamorphosis. G. H. S.

Pharmacology of body position and the labrynthine reflex. XXI. Caffeine. RUDOLF SCHOEN. *Arch. exptl. Path. Pharm.* **113,** 246–56(1926).—Acute caffeine intoxication of rabbits causes a simultaneous central stimulation and a paralysis The stimulation reveals itself in convulsions, increase in respiratory rate, in rotatory reaction and in the tonic cervical reflex. The paralysis is detected in the regulatory reflex in progressive reactions, and nystagmus. In subacute intoxication stimulation is followed by paralysis. **XXII. Hexetone and cardiazole.** *Ibid* 257–74.—Acute intoxication with hexetone and with cardiazole affords the same picture; small doses are stimulating, while larger doses are both stimulating and paralyzing. Hexetone is some 3 times more active than cardiazole. Intramuscularly, hexetone is about $^1/_{10}$ as active as when given intravenously, while with cardiazole the intravenous dose need only be doubled to attain the same effect by the subcutaneous route, or increased 4-fold by the oral route. In all cases the effect appears promptly (10 min.), and persists for 10–20 min. (introduced into the stomach 30–60 min.). The effects in thalamus rabbits are identical with those in the intact animal, and with larger doses similar effects are seen in decerebrate and spinal-cord animals, indicating that all parts of the central nervous system are attacked by both poisons. Despite certain individual differences, caffeine, hexetone, cardiazole and camphor may be grouped together on the basis of their effects. **XXIII. Antagonism of stimulating substances for narcosis.** *Ibid* 275–304.—Changes in the position and labyrinthine reflexes quantitatively show the antagonistic action of stimulating agents (caffeine, camphor, hexetone, cardiazole) for narcosis (alc., urethan, paraldehyde). G. H. S.

Point of attack of curare. KATHARINA HECHT, *Arch. exptl. Path. Pharm.* **113,** 314–20(1926).—Curare paralysis follows the "all-or-none law of narcosis," *i. e.*, there

is no active concn. of curare which does not ultimately cause a complete loss of indir. irritability. This behavior, characteristic of the paralysis of nerve, indicates that the point of attack of curare is a structure functionally belonging to the nervous syst. The course of curare action corresponds to the type of action exhibited by the paralyzing action of heat and narcotics on motor nerves (in contrast to muscle). G. H. S.

Effect of the concentration of narcotics on the isolated intestine. KATHARINA HECHT. *Arch. exptl. Path. Pharm.* **113,** 321-8(1926).—The reduction in contraction of the isolated intestine (rabbit) caused by urethan is due to a muscular paralysis while stimulus production is unchanged. The intensity of stimulus production, measured by the chromotropy, is independent within very wide limits of the concn. of narcotic. G. H. S.

Tolerance to poisons. KATHARINA HECHT. *Arch. exptl. Path. Pharm.* **113,** 338-42(1926).—Suspended in a soln. of urethan, which completely paralyzes the intestine, motility gradually returns even though the soln. is repeatedly renewed, showing clearly that the loss of activity cannot be due to a detoxication of the narcotic. The toxin fastness which develops quickly is retained for a long time after the intestine is transferred to Ringer soln. To effect a new paralysis of such tissue a higher concn. of narcotic must be used than was originally necessary. When an intestine paralyzed by urethan is brought into Ringer soln., it manifests after recovery far greater motility than before the narcosis. Thus it seems that during the narcosis (as in normal life) an increase in the store of utilizable energy occurs. G. H. S.

Toad poison. OTTO GESSNER. *Arch. exptl. Path. Pharm.* **113,** 343-67(1926).—Toad larvae have such a high relative immunity to toad poison that they are almost completely protected from the poison of their parents. *Alytes obstetricans*, as well as frog larvae, have no immunity to toad poison. *Alytes* skin ext. or *Alytes* skin secretion quickly kills frog and toad tadpoles, as well as *Alytes* larvae themselves. The skin ext. is toxic for frogs and true toads, causing systolic arrest. Toads have a relatively high immunity to their own poison and those of related species; indeed, the poisons derived from several species seem to be identical. The lethal dose of toad poison is some 80-100 times greater for toads than for frogs. With a lethal dose the toad shows systolic arrest. *Bombinator igneus* and *B. pachypus* have a skin secretion differing from that of the true toads. Their poison is not stable, being rendered inert by standing exposed to the air, by evapn., and by admixt. with blood. Pharmacologically, the effects are almost identical with those of the secretion of the skin of frogs. The poisons of *Bombinator igneus* and *B. pachypus* are identical, and, as their action on the isolated heart would indicate, they are less toxic than other toad poisons when administered parenterally. Both species (of *Bombinator*) succumb to toad poison as readily, and with the same manifestations of intoxication, as *Rana temporaria*.

G. H. S.

Effect of hydrocyanic acid on the gas metabolism of pigeons. N. MESSERLE. *Arch. ges. Physiol.* (Pflüger's) **213,** 419-26(1926).—During chronic HCN intoxication the CO_2 excretion falls shortly after the beginning of the treatment. The fall is at first abrupt, then more gradual, until (with a suitable dosage of HCN) it is less than half the initial value. If the administration of HCN is interrupted, CO_2 excretion again increases, but during the recovery period the value never reaches normal. In chronic poisoning the respiratory rate of pigeons falls progressively from 70-60 to 12-11 per min., and there is likewise a progressive fall in body temp. (in some cases more than 2°). G. H. S.

[The effect of various chemical substances upon] the blood vessels of the frog brain. GEORG SÁNDOR. *Arch. ges. Physiol.* (Pflüger's) **213,** 492-510(1926).—A method is described for exposing and microscopically observing the vessels at the base of the frog brain. The effects of substances which influence the vascular system were observed simultaneously on the brain vessels, those of the tongue, and the superficial vessels of the leg muscles. Such studies permit a grouping of the substances tested as follows: *(a)* those which constrict both arteries and capillaries (adrenaline, pituglandol, cocaine, alc.); *(b)* those which dilate both (chloral hydrate, NaBr); *(c)* those which constrict arteries and dilate capillaries (Na salicylate); *(d)* those which dilate arteries and constrict capillaries (caffeine, antipyrine). A sp. effect upon a definite vascular bed was noted in but 2 cases—pituitrin causing a strong but transitory constriction (followed by dilatation) of the vessels at the base of the brain, and Na salicylate (in concns. above 1:10,000) causing hyperemia of the tongue vessels. Solns. of the posterior lobe of the hypophysis constrict (vessels of the muscle) more strongly than 1:1000 adrenaline, while on the brain, both of the above are weaker than cocaine, alc., and Na salicylate. G. H. S.

I—ZOÖLOGY

R. A. GORTNER

The chemical composition of the spawn from Hemifusus tuba Gmel. YUTAKA KOMORI. *J. Biochem.* (Japan) **6**, 129–38(1926).—Nearly 2 kg. of fluid from the egg-sack of the gastropod *Hemifusus* was coagulated with heat in acid medium. This large coagulum extd. with alc. and ether yielded a white hygroscopic substance "crude vitallin," while the combined exts. were used for the prepn. of choline. From the 2 kg. of fluid 160 g. of the crude vitallin was obtained. The following is the amino acid compn of this substance: glycocoll, none; alanine, 0.71%, valine, 0.27%; leucine, 10.29%; isoleucine, none; proline, 1.1%; phenylalanine, 0.22%; aspartic acid, 1.6%; glutamic acid, serine and histidine, none; tyrosine, 0.8%; arginine, 3.73%; lysine, 0.86%, and tryptophan, 1.49%. S. MORGULIS

The physiological basis of wing production in the grain aphid. L. ACKERMAN *J. Exptl Zool.* **44**, 1–61(1926).—Grain aphids (*Rhopalosiphum prunifoliae*), reared on plants in various salt solns., showed no changes in wing production that could be correlated with the salt content of the food. The hemolymph of these aphids contains 4 kinds of globules, two of which are pigmented and 2 of colorless lipoid substance. The large lipoid globules will solidify when the aphid is exposed to a low temp. for 1 hr. The solidification temp. of the fat globules is const. for aphids grown at a given habitat temp. Changes in habitat temp. are accompanied by a change in the temp. of fat solidification. The fat-solidification temp. of winged aphids was several degrees lower than that of wingless aphids raised at the same habitat temp. When aphids were transferred from one temp. to another the time required for the fat solidification temp. to become const. varied from 1 to more than 2 weeks. This time was shortened by overcrowding; also when the offspring rather than the original aphids were tested. This change is due to the direct effect of the temp. on the aphid and not to its effect on the food plant. The fat globules solidified at low temps. (7° to —3°); those from aphids reared at 24° m. approx. 65°. The brown pigment from the pigmented globules is sol. in the fat globules and when dissolved in them increases their solidification temp. The delicate membranes surrounding the pigmented globules are easily ruptured by chem., mech. and thermal disturbances. Solidification of the fat globules on exposure to low temps. is probably not directly due to the effect of temp. on them, but rather to effects of temp. change on the pigmented globules. A certain min. temp. change is probably required to disrupt the less resistant pigmented globules which then discharge the brown pigment that causes the fat to solidify. This pigment is probably an unstable anthraquinone deriv. Wing production in the grain aphid is dependent upon changes in the concn. of certain materials in the hemolymph as influenced by the rupture of the pigmented globules. CHAS. H. RICHARDSON

Effect of certain chemical and physical agents on fecundity and length of life and their inheritance in a rotifer, Lecane (Distyla) inermis (Bryce). [illegible]

[illegible] concns. causing a marked increase. In spring water over EtOH vapor, egg production and length of life were decreased. In malted-milk culture, EtOH for 11–13 weeks decreased egg production. The effects of EtOH were transmitted for 2 generations, and then disappeared. In the same culture, $FeCl_3$ (*N*/12,000 and *N*/120,000) and $NaSiO_2$ (1 drop in 10 cc.) decreased egg production and the effects produced by them were not inherited. The optimum temp. for egg production is 22.3-27°, above and below which it decreased. Length of life is a function of temp. and obeys van't Hoff's law within reasonable limits. No permanent inheritance of changes in egg production and length of life produced by temp. was observed. C. H. R.

Depression of oxidative metabolism and recovery from dilute potassium cyanide. J. W. BUCHANAN. *J. Exptl. Zool* **44**, 285–306(1926).—Four hrs.' exposure of *Planaria dorotocephala* to dil. solns. of KCN depressed O_2 consumption to a level at which it remained practically const. Removal from the KCN soln. caused O_2 consumption to rise above normal and return to normal in 6 hrs. The same result is obtained with 24 hrs.' exposure. The depressive action of KCN on oxidative metabolism is probably in large part physical, and is not adequately explained by Warburg's theory (*C. A.* **16**, 1436; **17**, 3192; **18**, 3198). There is a positive correlation between the degree of depression and the normal rate of O_2 consumption. No evidence was found for the reconstitution of a residual substance contg. O_2, or for the accumulation of oxidizable substances during depression. The expts. support Childs' conception of differential

susceptibility. **Some antagonistic and additive effects of anesthetics and potassium cyanide.** *Ibid* 307–25.—Et_2O and EtOH solns. protect slightly against the depressive action of weak KCN soln. on the O_2 consumption of *Planaria dorotocephala*. With the same concn. of Et_2O, death and disintegration of *Planaria* are hastened in stronger KCN solns. C. H. R.

The metabolism of water in ameba as measured in the contractile vacuole. E. F ADOLPH. *J. Exptl. Zoöl.* **44,** 355–81(1926).—Change of external conditions does not greatly alter the rate of H_2O elimination by the vacuoles. H_2O is not eliminated merely because it has unavoidably diffused into the body. C. H. R.

The occurrence, storage and distribution of glycogen in Hydra viridis and Hydra fusca. M C. YODER. *J. Exptl. Zool.* **44,** 475–83(1926).—Glycogen occurs in these 2 hydras as a reserve food supply. It is found almost exclusively in the endoderm, and is generally more abundant in *viridis* than in *fusca*. It is more abundant in the active growing parts (buds, ovaries, testes) of these animals. Methods are given. C H. R.

The toxic action of copper on Nitella. S. F. COOK. *J. Gen. Physiol.* **9,** 735–54 (1926).—The toxicity curve derived from the effect of $CuCl_2$ on *Nitella*, with turbidity of the cells as the criterion of toxicity, is sigmoid in shape This curve can be fitted approx. by an empirical equation. When the concn. of $CuCl_2$ is varied, the toxic effect varies as a const. fractional power of the concn. whether the concn. is plotted against: (1) time necessary to reach a given point on the ordinate of the survivor curve, (2) max. speed of toxic action as shown by the tangent to the survivor curve, or (3) the first derivation of the equation which fits the survivor curve. When the temp. is varied and the log of the reciprocal of the time necessary to reach a given point on the survivor curves is plotted against the reciprocal of the absolute temp., the resulting figure consists of several intersecting curves. An hypothetical system is described which gives similar results. C. H R.

Relative susceptibility to arsenic in successive instars of the silkworm. F. L. CAMPBELL. *J. Gen. Physiol* **9,** 727–33(1926); cf. *C. A.* **20,** 2534—Larvae of *Bombyx mori* were fed measured doses of Na_3AsO_3 and Na_3AsO_4 solns. at different periods of larval life. Susceptibility to As (detd as 1000 ÷ survival time in min) was greatest in the younger larvae and decreased with increasing age. Toxicity paralleled velocity of growth which also decreases during larval development As^{III} was more toxic than As^{IV}. Relative susceptibility may be expressed numerically as a ratio of areas under susceptibility curves. C. H. R.

12—FOODS

F. C. BLANCK AND H. A. LEPPER

The relation between cell membrane and crude fiber. W. KERP AND R. TURNAU. *Arb. Reichsgesundh.* **57,** 531–44(1926).—Expts were carried out with various vegetables to establish the relation between cell membrane, crude fiber pentosans and "rest-substance" (so called by Rubner), which is the part of the cell membrane not contg. cellulose and pentosans. A historical review of these terms is given together with a brief description of the work of Rubner concerning the proportion of cellulose to cell membrane (*C. A.* **11,** 2512; **12,** 960, 961, 1563; **14,** 1389). The present work deals in particular with a comparison of the values for crude fiber and cell membrane. The following values for the ratio of pure cell membrane to crude fiber were found: 2 samples of carrots: 2.29 and 1.94, resp.; very young carrots: 2.79; spinach: 1.69; cabbage: 2.17; head lettuce: 1.94; potato flour: 1.96; and oat straw: 1.60. Complete analyses of all are given. The crude cell membrane from all samples contained abundant amts. of nitrogenous compds , which was in agreement with Rubner's data. The high content of pentosans found in the cell membrane of young carrots proved that the cell membrane of young plants does not consist exclusively of cellulose, and the proportionately low content of crude fiber in the cell membrane showed that the latter consists of more easily hydrolyzable compds. than does that of older carrots or of the other vegetables. Comparative tables with the results of Rubner are given; these in general agree well. From them it may be seen that on detn. of crude fiber instead of cellulose, the values obtained differ very little in order of magnitude. With sufficient data at hand it is expected that the content of cell membrane in plants of the same genus can be calcd. from the content of crude fiber with sufficient accuracy. D. THUESEN

Determination of volatile oil in spices. C. GRIEBEL. *Z. Untersuch. Lebensm.*

51, 321–4(1926).—Pour 300 cc. H_2O on to 10 g. of the ground spice in a l. flask and dist. off 200 cc., using a doubly bent distg. tube and a short condenser arranged vertically. Treat the distillate in a sepg. funnel with 60 g. NaCl, and shake out with 3 20-cc. portions of pentane. Evap. the pentane carefully, leaving the volatile oil, which then weigh. This method gave good results with cinnamon, cloves, caraway and fennel. The advantages of this method over others in common use are the greater accuracy, the shorter time required and the simplicity of the app. W. J. H.

Information on honey. F. Lucius. *Z. Untersuch. Lebensm.* **51,** 351–7(1926).—The simple sugars can be sepd. from the dextrins of honey by pptn. with ether from alc. soln. In such a purified sugar mixt. there can be detd the content of total sugar, of glucose and of fructose by the usual methods Fructose can be accurately detd by the difference in rotation before and after destruction of the fructose by acid. William J. Husa

Investigation of milk and cream bonbons and the determination of milk fat and coconut oil in fat mixtures. Heinrich Fincke. *Z. Untersuch. Lebensm.* **51,** 357–68 (1926); cf *C. A.* **20,** 2373.—The Kirschner no , for which a modified procedure has been devised, is in combination with a correction factor obtained from the Polenske no., a useful method for detn of milk fat even in mixts. contg. coconut oil. It is shown that the process of prepg milk bonbons causes no change in the consts. of the fats contained therein, thus it is possible to det. their compn with sufficient accuracy. W. J. H.

Detection and determination of dirt in milk. Vollhase. *Z. Untersuch. Lebensm.* **51,** 373–4(1926).—A brief discussion. William J. Husa

The significance of the specific electrical conductivity of milk and a new, practical procedure for its determination. Viktor Gerber. *Z. Untersuch. Lebensm.* **51,** 336–51(1926) —The cond vessel used can be constructed in any lab The advantage of the method is simplicity of app. and economy of space. William J. Husa

"Apparent ropiness" (thread formation) in milk due to surface influence. A. T. R. Mattick *J. Agr. Sci.* **16,** 459–65(1926) – A phys form of "ropiness" in milk is described and shown to be due to the formation of thin films of casein and (or) lactalbumin at the milk-air interface. The "ropes" are a form of the "mechanical surface aggregates" of Ramsden and may occur on appropriate surfaces, such as ordinary farm coolers, whenever the rate of flow, temp. and acidity conditions are favorable. A modification of Ramsden's method, demonstrating the formation of mechanical surface aggregates in a hitherto unobserved form, is described, *viz.*, horizontal glass tubes in parallel, which are especially suitable for opaque fluids. P. R. Dawson

Chamomile (Mayweed) and a taint in milk. F. Procter. *J. Agr. Sci.* **16,** 443–50(1926) —When fed to cows in sufficient quantity chamomile, particularly *Anthemis cotula*, causes a taint in the milk. The tainting principle is a volatile chem. substance or substances, extd. by petroleum ether. The addn. of such exts. to milk yields to the latter the typical chamomile taste; similarly oral administration to cows of water suspensions of the exts results in milk taint. P. R. Dawson

Lemon cheese. G. D. Elsdon. *Analyst* **50,** 230–4(1925). H. G.

Relation of kernel texture to the physical characteristics, milling and baking qualities and chemical composition of wheat. J. H. Shollenberger and D. A. Coleman. U. S. Dept. Agr., *Bull.* **1420,** 1–16(1926).—Results are given of a comparative study of the phys. characteristics, milling and baking qualities and chem. compn. of the hard, mottled and starchy types of kernels of hard red spring, hard red winter and durum wheats. For these 3 classes of wheat, the hard kernel was consistently highest in sp. gr , usually highest in flour yield and color of loaf, decidedly superior in water absorption, wt. of loaf, and crude protein content, and slightly higher in ash, crude fiber and acidity. The mottled-kernel type was slightly superior in test wt. per bushel and wt. per 1000 kernels, but in other qualities this type was of medium grade. The starchy type of kernel was slightly superior to the other types in av. fat content of wheat and in bran yield, and in the durum wheat produced the bread of greatest vol. and of best texture, but in almost all the important milling and baking quality factors this type was inferior to the other types. The dark-kernel sepns. averaged lowest in fat content of wheat, the mottled-kernel sepns. in bran yield, milling gain and crude fiber, while the starchy-kernel sepns. were lowest in all the other factors listed. From the standpoint of these averages, the dark kernels are considered to be decidedly superior to the other types of kernels and the starchy kernels just as decidedly inferior. W. H. R.

Determination of the amount of flour retained by grain offal in the milling of wheat. Marcel Arpin and G. Delarouzée. *Ann. fals.* **19,** 411–6(1926).—The following procedure is satisfactory for routine control of milling operations. Triturate a 1-g. sample of flour or 2-g. sample of offal in a glass mortar with 40 cc. H_2O at 15°, prep. a

Buchner funnel by placing a disk of No. 100 (No. 80–120) bolting silk and covering with a 1.5–2 g. mat of ignited asbestos, place a piece of No. 240 bolting silk over the top of the funnel and hold in position by means of an elastic band, throw the triturated sample on the filter and wash thoroughly till the particles of bran, etc., on the top piece of bolting silk are not colored by I soln., repeating the trituration in the mortar as often as may be necessary, wash with 200 cc. of water, transfer the starch and asbestos mat to a 300-cc. flask, washing to a total vol. of 150–200 cc., add 10 cc of 22° Bé. HCl, heat 90 min. in an autoclave at 120°, cool, make alk. by adding 20 cc. of 36° Bé. NaOH, make up to 300 cc. (if working on wheat or on flour) or to 200 or 250 cc. (if working on offal), and det. glucose in an aliquot *via* Bertrand. The max. time required for a single detn. is 2 hrs. 10 min., and 6 detns. can be carried out in 5 hrs. 30 min., with a single funnel Control of operations during 1 month during which 26,675.7 tons of wheat were milled showed agreement within 0.25% between the total amt. of flour available in the wheat and the actual amt obtained plus that remaining in the offal A PAPINEAU-COUTURE

The Vandam number of Egyptian buffalo milk. A. AZADIAN. *Bull. inst. Egypte* 8; *Ann. fals.* 19, 421(1926).—Analysis of 69 samples of known purity gave a Vandam no (casein·fat) of 0.42–0 63, av. 0 57; and calcg on a basis of 5% fat, which is the legal min. for Egyptian buffalo milk, the max Vandam no. would be 0 82. A. P.-C.

Quality of New Zealand wheats and flours. L. D FOSTER. *Trans Proc. New Zealand Inst* **56**, 738–43(1926), cf. *C. A* **20**, 2547 —Analysis of flour ash failed to show any relationship between the CaO and MgO contents of the ash and the baking value. A certain parallel was found between the amts. of CaO and MgO in the flour and the protein content, and between the MgO in the flour and the ratio of wet to dry gluten. A distinct relationship was found between the amts. of P_2O_5 in the flour and the amt. of ash. A PAPINEAU-COUTURE

Chemistry of New Zealand wheats and flours. I. Degree of buffering and baking value of some local wheat flours. L. D. FOSTER *New Zealand J Sci Tech* **8**, 236–42 (1926); cf. *C. A.* **20**, 2547 —Examn. of 31 flours obtained from pure varieties of New Zealand wheats showed that in those flours with approx the same protein content the loaf-vol. was closely correlated with the degree of buffering of the flour In the flours examd. highly buffered flours invariably produced loaves of smaller vol than their protein content indicated; conversely, lightly buffered flours invariably produced loaves of better vol than their protein content indicated There was only a slight relationship in this series between degree of buffering and ash content in the different flours. There was no relationship between degree of buffering and the original p_H of the flour, absorption of water, or ratio of wet to dry gluten. A. PAPINEAU-COUTURE

The bleaching of flour. D. MAROTTA AND F. DI STEFANO. *Ann chim. applicata* **16**, 191 200(1926) —Comparative tests of the methods of Miller (*C. A* **18**, 3235), Javillier (*C. A* **20**, 784) and Rothenfusser (*C. A* **19**, 1740) show that none can be relied upon to detect benzoyl peroxide in flour. Only when it is present in amts higher than those ordinarily used for bleaching can it be identified with certainty. The tests were carried out by adding to various grades of flour different amts of *Novadelox*, which analysis showed to be composed of 25% benzoyl peroxide and 75% Ca phosphate Bleaching tests showed *Novadelox* (20 g. per quintal of flour) to be ineffective with 85 90% bolted flour, but to give good results with 60% flour. Its bleaching power is accelerated by heat, and flour contg. *Novadelox* is not attacked by insects or mold. The relative amts. of benzoyl peroxide present before and after bleaching indicate that its action is catalytic rather than that it furnishes O only by direct decompn. C. C. D.

The valuation of some recently suggested chemical baking expedients for the improvement of the capacity for baking of flour. F. SCHRODER. *Arb. Reichsgesundh.* **57**, 598–611(1926).—Expts on the influence of $KBrO_3$, $K_2S_2O_8$, $(NH_4)_2S_2O_8$ and NaH_2BO_4 $3H_2O$ on the vol. and porosity of the bakings are described. Eighteen expts. with addns of 0.003–0.008 g. $KBrO_3$ showed 8 8% av. increase in vol.; this was 16.6% in the max. case. Twenty-seven expts. with addns. of 0 005–0 1 g. $K_2S_2O_8$ showed 16.3% increase in vol in the max case; increase averaged 7.3% for 24 expts. with addns. of 0.01–0 02 g One expt. with an addn. of 0.1 g. $K_2S_2O_8$ was carried out to det the possibility of bleaching the bran particles in flours rich in bran so as to give the bakings the appearance of having been made from a better grade of flour. This gave a negative result and worked rather in the opposite direction. Seventeen expts. with addns. of 0.004–0.04 g. $(NH_4)_2S_2O_8$ showed 8.6% av. increase in vol. and 21.2% in the max. case. With $NaH_2BO_4.3H_2O$ addns. of 0 0015 g. showed 9.7% av. increase and 15% in the max. case. Mixed addns. of $KBrO_3$, $(NH_4)_2S_2O_8$ and $NaH_2BO_4.3H_2O$ showed that the added activities of two or all three salts could not be obtained, but a max. case of 25.3%

increase in vol. was noted on the addn. of 0.004 g. $KBrO_3$ and 0.008 g. $(NH_4)_2S_2O_8$; 10.9% av. increase. No far-reaching regularity in the vol. effects developed with these salts or salt mixts. could be found. For the majority of the cases an increase in vol. was brought about with any of the salts employed. For some kinds of flour the one or other kind of salt failed without any indicated reason. The favorable effects of the salts, no doubt, are connected with an influence of the capacity for swelling of the flour, and in particular with the proteins, gliadin and glutenin, formed by the glutin. From the close relation of the H-ion concn. of dough to the capacity for baking of the flour concerned (*C. A.* **7**, 1769) it is assumed that the salts employed and the decompn. products of these cause an increase of the H-ion concn. and carry this closer to the optimum value, $p_H = 5$. The effects of the salts on the consistency of the dough showed that somewhat more water could be used by the prepn without detrimental effect on the bakings. No fundamental increase in the wt. of the bakings on addn. of these salts over those without could be found, but a more uniform porosity was noted. The practical use of these salts proved to be without detrimental effect on the flavor of the bakings or on the health after continued use. D. THUESEN

Pectin. J. W. MCKINNEY. *J. Soc. Chem. Ind* **45,** 301–4T(1926).—A review is given with an extensive bibliography. The pectic series consists of 4 substances: protopectin, the mother substance; pectin which has the power of forming jellies; pectinic acid, an unstable intermediary not yet well defined; and pectic acid, hydrolysis of which results in complete breakdown of the mol. The properties of each of these substances are recorded. A method is described for the extn. and purification of pectin from fruits or vegetables. Analyses of products show an ash content as low as 0.5%. Analyses of orange ash show its compn. before and after extn. of the pectin with oxalic acid. N. M. NAYLOR

Cocoa by-products and their utilization as fertilizer materials. G. P. WALTON AND R. F. GARDINER U. S Dept. Agr., *Bull.* **1413,** 1–44(1926).—Analyses are given of representative cocoa press cakes, solvent-extd. cocoas and cacao shells Several of the samples analyzed satisfy the chem requirements for edible cocoa powder. More than $^1/_3$ of the total N of both the pressed cake and solvent-extd. cocoa is water-sol, but the insol. org. N is of inferior quality. The alkaloid N is water-sol and may constitute 50 to 60% of the total water-sol. N. Cocoa press cake contains less N and P_2O_5 but twice as much K_2O as castor pomace, and is similar to com. "cottonseed feed" in crude plant-food content The sum of the water-sol. N and active insol. N in cocoa press cakes and extd. cocoas forms a smaller proportion of the total N than in the cottonseed meal and castor pomace. Ground cocoa cake makes a satisfactory conditioner for mixed fertilizers and it is suggested that the solvent-extd. cocoa may have value as a raw material in the prepn. of theobromine. Cacao shells contain less N and P_2O_5 but considerably more K_2O than the av. by-product cocoa cake. The quality of the N in the shells is lower than that of the cake and extd.-cocoa N. W. H. ROSS

Distribution of volatile flavor in grapes and grape juices. J. W. SALE AND J. B. WILSON. *J. Agr. Research* **33,** 301–10(1926).—A rapid and accurate method has been developed for detg. anthranilic-acid ester in grapes, grape products and imitation grape prepns. The anthranilic-acid ester in 84 samples of whole grapes, representing about 55 varieties, varied from 0.00 to 3.80 mg. per kg. The volatile esters and volatile acids in 50 samples, representing about 34 varieties, varied from 6 to 366 and from 3 to 121 mg per kg., resp. Anthranilic acid ester has not been found in the fruit of *Vitis vinifera* and the detn. of this ester, therefore, appears to be of value in identifying species. Contrary to general opinion, the volatile flavor of grapes is not contained wholly in the skins, as substantial proportions are found in the pulp and in the expressed juices. Anthranilic-acid ester tends to disappear from grape juice which is stored The content of this ester in 14 samples of com. bottled grape juices of unknown origin varied from 0.00 to 1.35 mg. per l. The volatile ester in 8 of these samples varied from 5 to 29 mg. per l. W. H. ROSS

Studies on the nutritive properties of seaweed. E. G. COLLADO. *Philippine Agr* **15,** 129–48(1926).—Three seaweeds, guraman (*Gracilaria confervoides*), culot (*Laurencia*) and aragan (*Sargassum* ....) contained H_2O 15.73, 9.33, 33.44; protein 5.00, 8.62, 5.01; ether ext. 1.17, 1.21, 1.29; ether-free ext. 60.96, 53.79, 30.24; crude fiber 6.70, 8.38, 5.13; ash 6.82, 18.66, 24.89; and I 0.020, 0.439 and 0.390%, resp. These seaweeds did not support life in guinea pigs even when supplemented with other foods. They contain little vitamin B. The rate of decrease in wt. of rats fed with these seaweeds is proportional within certain limits to their I content. It is thought that their

deleterious effects were due to the I. A bibliography of 25 citations is appended.
A. L. MEHRING

The ensilage of sugar-beet tops. H. E. WOODMAN AND A. AMOS. *J. Agr. Sci.* **16,** 406–15(1926).—Analyses of sugar-beet tops before and after ensilage by various methods are given. As an emergency measure during periods of food shortage, provided whole tops are used and care is taken to insure tight packing, a silage of good quality, palatable and of considerable nutritive value may be obtained. However, large losses of food material may occur as a result of copious drainage; these losses may be measurably reduced by the admixture of wheat chaff or other absorbent material.
P. R. DAWSON

Revised net-energy values of feeding stuffs for cattle. E. B. FORBES AND MAX KRISS. *J. Agr. Research* **31,** 1083–99(1925).—An improved method of computation of the net-energy values of feeding stuffs has been applied in recomputing and correcting the net-energy values of feeds for the maintenance and body increase of steers as previously published from the Inst. of Animal Nutrition of the Pennsylvania State College.
W. H ROSS

The maintenance requirement of dry cows. D C. COCHRANE, J. AUGUST FRIES AND W. W. BRAMAN. *J. Agr. Research* **31,** 1055–82(1925).—The net energy required for maintenance by 3 dry cows was detd in a series of respiration calorimeter expts. to be 4.150, 5 420 and 5 566 therms, resp., per 1000 lbs of live wt. Since 2 of the 3 detns. of maintenance requirement fall within the range of variation of the values previously found for steers, there is, therefore, no definite warrant for anticipating the establishment of a maintenance requirement for cows differing from that of steers. In these expts there were gains of energy by all 3 subjects on rations computed to supply the maintenance requirements in accord with the 6-therm av. The net-energy value of a ration composed of 40% alfalfa hay and 60% grain mixt. was found to be 1.418 therms per kg. of dry matter of the ration, as detd. by direct measurement of the heat production of the animals A method of approximating the apparent digestibility of a ration where it is impracticable to collect the manure and urine separately is reported.
W. H. ROSS

Digestibility trials with poultry. I. The digestibility of English wheats, with a note on the digestibility of fiber in Sussex ground oats. E. T HALNAN. *J. Agr. Sci.* **16,** 451–8(1926).—In expts. with Little Joss and Yoeman II wheat, closely concordant results for all nutrients other than ether ext were obtained, and the view was supported that the digestibility of crude fiber by poultry is negligible. Except the crude fiber and ether ext., poultry appear to be able to digest wheat as efficiently as other farm animals. General agreement with the results of previous work was shown, except in protein, where the digestibility coeffs. were distinctly higher than those hitherto recorded. Explanation for this may be sought in the improved methods for estg. uric acid and NH_3. The av. digestibility coeff. of crude fiber in whole oats is 9.0% and grinding as in Sussex ground oats does not improve the digestibility. P. R. DAWSON

Elephant grass. A new and useful fodder crop in Western India. H. H. MANN. Dept. of Agr., Bombay Presidency, *Bull.* **127,** 7 pp.(1926).—A sample of fresh green fodder from elephant grass (*Pennisetum purpureum*) contained H_2O 61.81, ether ext. 0.29, proteins 2 92, digestible carbohydrates 17.29, woody fiber 14.77, and ash 2 92%. This material is meeting with favor as a fodder crop in Western India. K. D. JACOB

Apparatus for desiccating milk, eggs or other liquids in vacuum (U. S. pat. 1,597,-809) **1.** Apparatus for carbonating liquids (U. S. pat. 1,598,787) **1.**

Food. W. D. RICHARDSON. U. S. 1,599,030, Sept. 7. A mixt. of blood and carbohydrate material, such as starch, glucose or sucrose, is subjected to fermentation with lactic-acid bacteria, and, after the fermentation has proceeded to substantial completion, the product is dried and ground. U. S. 1,599,031 (K. K. JONES) specifies a similar product made with yeast instead of with lactic-acid bacteria.

Preserving fruits from decay. W. R. BARGER and L. A. HAWKINS. U. S. 1,598,-697, Sept. 7. Decay of citrus or other fruits caused by green mold formed by *Penicillium digitatum* Sacc. is prevented by treating the fruit with a soln. of borax 2.67 and H_3BO_3 5.33 in H_2O 100 parts.

"Bulgarian" milk. H. BUEL. U. S. 1,593,899, July 27.

Crude milk sugar. R. W. BELL. U. S. 1,600,573, Sept. 21. Casein and fat are removed from milk and the acid reaction of the whey is adjusted to a p_H of about 7.0 by addn. of a suitable alkali. The whey is forewarmed to about 60°, concd. at a temp.

below the coagulating point of albumin to a point at which the lactose just fails to crystallize and the concentrate is cooled to about 0° and maintained at this temp. until a max. crystn. of lactose has been effected.

Apparatus for pasteurizing milk in bulk. J. TELLES. U. S. 1,599,730, Sept. 14.

Treating cream. R. K. COONEY. U. S. 1,599,649, Sept. 14. Cream of high acidity is treated with a neutralizing agent, *e. g.*, lime, to reduce its acidity, pasteurized, and passed while heated through a centrifugal machine to remove substantially all the solids formed by the reaction of the neutralizing agent. U. S. 1,599,650 specifies treating cream of high acidity with Na_2CO_3 without heating the cream before or during the reaction, then pasteurizing and centrifuging in a clarifier at pasteurizing temp. for removing solids, and centrifuging again in an app. which removes substantially all liquid formed by the reaction of the neutralizing agent, and, while heated, adding milk to adjust the quantity of butter fat.

Ice cream. H. F. ZOLLER. U. S. 1,598,033, Aug. 31. Unhydrolyzed alkali caseinate is used with other (usual) ingredients.

Separating proteins and other substances from whey. R. W. BELL. U. S. 1,600,-161, Sept 14 Casein and fat are removed from milk so as to obtain whey, the acid reaction of which is adjusted to a p_H of about 7.0 by the addn. of alkali, the whey is forewarmed to about 60°, concd at a temp. just below the coagulating point of the albumin to a concn. at which the lactose just fails to crystallize and cooled to about 0°. This temp. is maintained until a max. crystn of the lactose has taken place, the lactose crystals are removed by centrifuging or otherwise, salts present may be reduced by electrodialysis, the reaction of the concd. albumin soln. is adjusted to a p_H of about 7.3 and the greater part of the remaining H_2O is removed at a temp. below the coagulating point of albumin, thus producing a powder contg. practically all of the proteins, part of the salts and a small part of the lactose of the whey. This product is suitable for use as a substitute for egg albumin or serum albumin.

Preserving vegetables. J. BRUNA. U. S. 1,592,719, July 13. Vegetables are subjected to the action of dry heated air to remove the outer moisture, the temp. is then sufficiently reduced to prevent cooking, then increased for an appreciable period and the vegetables are afterward chilled to seal their pores.

"Yeast assistant" for use in making bread. A. H. FISKE. U. S. 1,599,563, Sep. 14. A mixt is described, comprising salt 25, $CaSO_4$ 25, Ca phosphate 10, NH_4Cl 10, KNO_3, $NaNO_3$ or NH_4NO_3 1 and corn-starch flour or the like to make a total of 100 parts A small proportion of this mixt. is used in making dough for yeast-leavened bread

Enzymic composition for use in making bread. J. TAKAMINE, J. TAKAMINE, JR. and N. FUJITA. U. S. 1,599,930, Sept. 14. A stable compn. is prepd. from glucose sirup and an ext. from a fungus such as *Aspergillus oryzae* which has diastatic and proteolytic properties.

Edible alkali caseinate. H. F. ZOLLER. U. S. 1,598,334, Aug. 31. A liquid suspension of acid-pptd. casein, in the presence of a weak soln. of alkali phosphate, is treated with a soln. of NaOH or other suitable alkali soln. until the casein is dissolved without material excess of alkali.

Beverage (concentrated sauerkraut juice mixed with carbonated water). C. M. BOGLE. U. S. 1,596,233, Aug. 17.

13—GENERAL INDUSTRIAL CHEMISTRY

HARLAN S. MINER

Equations of state and their industrial importance. PIERRE HERRENT. *Bull. féd. ind. chim. Belg.* **5,** 181–9(1926).—A general discussion of phase-rule diagrams of industrial importance. W. B. PLUMMER

Types of building construction for the chemical plant. H. R. PARKER. *Chem. Met. Eng.* **33,** 545–9(1926). E. J. C.

Industrial diseases in 1925. THOMAS LEGGE. *Chem. Trade J.* **79,** 305–7(1926). E. J. C.

Carbon monoxide poisoning and the automobile exhaust. J. B. CLEMENS AND W. G. THOMPSON. *Bull. N. Y. Acad. Med.* **1926,** 402–40.—A review. E. J. C.

Benzene poisoning as an industrial hazard. I. Chemistry and industrial uses of benzene. LEONARD GREENBURG. *U. S. Public Health Repts.* **41,** 1357–65(1926).—Description of the early history of benzene and its manuf. from coal tar and from coal gas. When benzene is used in closed app. there is very little hazard except that due

to carelessness in cleaning tanks, breaks in piping systems, etc. When benzene is allowed to evap. freely into the air of the workroom, as in the making of rubber tires, artificial leather, sanitary cans, in dry cleaning, and in connection with the handling of paints, varnishes, stains and lacquers there may be danger of chronic poisoning. **II. Acute benzene poisoning.** *Ibid* 1365–75.—A review of many acute cases reported by other investigators with description of symptoms and of the hazard, discussion of treatment, and of toxic concns **III. Previous studies of chronic benzene poisoning.** *Ibid* 1410-22 —The reports of 38 investigators of this phase of the subject are reviewed at length. **IV. Effect of benzene upon the blood cells and its use as a therapeutic agent.** *Ibid* 1422 7.—The typical result of exposure to benzene is a decrease in white-blood cells, often followed by similar reduction in red cells. **V. Extent of the benzene hazard in industry in the U. S.** *Ibid* 1427–31.—Questionnaire replies from 84 firms who make or use benzene revealed 15 fatalities and 83 cases of illness due to benzene. In Ohio 29 compensatable cases occurred in 5 yrs. **VI. Intensive study of selected industries with respect to factory conditions and pollution of the atmosphere by benzene.** *Ibid* 1516-25 -The concn of benzene and solvent vapors in factory atms. was detd. by adsorption in activated charcoal and weighing; the interference of H_2O and CO_2 was prevented by $CaCl_2$ and soda-lime tubes, and by equilibration. The app. is portable, simple, time-saving and sufficiently accurate. A 20-l. sample of air is taken in about 20 min. Benzene was found in concns from 20 to 4140 p p. m. **VII. Results of medical and clinical tests to discover early signs of benzene poisoning in exposed workers.** *Ibid.* 1526–35.—It was not possible to establish a const. relation between physiol. effects and atm. concn. of benzene. However, it is felt that a concn. even as low as 100 p. p. m. involves a substantial hazard. In addition to adequate and proper ventilation and safety measures it is recommended that each employee have a medical examn. before employment and a reexamn , with systematic blood counts, once a month thereafter. **VIII. Bibliography.** *Ibid* 1535–9.—106 references. C. M Salls

Clinical and laboratory investigation of the effect of metallic zinc, of zinc oxide, and of zinc sulfide upon the health of workmen. R. P. Batchelor, J. W. Fehnel, R. M. Thomson and Katherine R. Drinker. *J. Ind. Hygiene* **8**, 322–63(1926).—Detailed clinical and lab. studies of 24 workmen in a dusty Zn plant indicate that Zn dust is not poisonous The concn. of Zn dust in the air was detd. by elec. pptn.; it varies from 0 03 mg. to 3.7 mg per cu. ft. Zn is excreted by normal individuals who are not exposed to Zn dust Tests on 18 normal subjects outside of the Zn industry showed an av. excretion of Zn in the urine of 1.12 mg per 24 hrs. and in the feces of 9.32 mg. per 24 hrs Although Zn workers absorb and excrete Zn in amts. considerably over this normal and maintain constantly a blood Zn content slightly higher than normal, no symptoms or evidence could be found of injury caused by the Zn. C. M. Salls

Modern metallurgy and ancient industries (Rosenhain) 9.

Annual Reports of the Society of Chemical Industry on the Progress of Applied Chemistry. Vol. X. 46-47 Finsbury Square, London, E. C.: Officers of the Society. 661 pp. Reviewed in *Chem. Trade J.* **79**, 197(1926).

Absorbing gases. E. Schmidt. Can. 258,003, Feb. 9, 1926. Gases or vapors are absorbed by means of active charcoal; the coal used is obtained by carbonization in the presence of K_2S, polysulfides or a mixt of K_2S and K_2CO_3

Reaction between liquids which tend to form emulsions. F. H. McBerty. Can. 258,590, Mar 2, 1926. Liquids, adapted to react on each other and not miscible with each other, but tending to form tight emulsions, are caused to react with each other without forming tight emulsions by mixing them, sepg. them before the reaction is completed, remixing them, continuing the operation until the reaction is completed, then finally sepg. them.

Dissolution in organic solvents. H. Finkelstein. Can. 262,404, July 6, 1926. Prepn. of solns., *e g.*, of resins, in alkyl ethers of glycol or in other org. solvents is specified

Storing acetylene or other explosive gases. Norddeutsche Acetylen- und Sauerstoffwerke Akt.-Ges and J. Pommee. Brit. 241,468, April 27, 1925. C_2H_2 or other explosive gas is stored in soln in a container with a tightly packed filling of an absorbent mineral substance such as kieselguhr or pumice which has been fritted and granulated to pieces of uniform size (*e. g* , 2-3$^1/_2$ mm. diam.). The interstices between the grains may be filled with finely powd. pumice, kieselguhr, SiO_2 gel or the like.

Testing porosity of heavy fabrics or other materials. G. B. HAVEN. U. S. 1,599,-964, Sept. 14. A const. rate of flow of air is maintained through a definite area of the material being tested and the pressure required to maintain this flow is measured.

Molding pulp. F. FOY. Brit. 241,545, Oct. 15, 1924. Articles are compressed and dried, while on the mold, by use of heated Hg or other suitable liquid. An app. is described.

Insulating composition. H. T. COSS. Can. 262,402, July 6, 1926. An insulating compn. consists principally of silica in the form of tridymite produced by calcining fabricated bodies made of a mixt of diatomaceous earth, lime and water.

Electric insulators for pressure stills. G. D. WHITE. U. S. 1,600,441, Sept. 21. A mounting is specified for holding elec. conductors passing through still walls.

14—WATER, SEWAGE AND SANITATION

EDWARD BARTOW

Examinations of sources for water supplies. New methods of treating waters. PETER *Mitt. Lebensm. Hyg.* **17,** 159(1926).—The ground-water flow may be estd. from the rainfall and drainage area. A good spring does not change in temp. or quantity of flow throughout the seasons Sanitary conditions of the drainage area must be good Common methods of filtration and sterilization are described. K. C. B

Geological surveys for water supplies. J. HUG. *Mitt. Lebensm. Hyg* **17,** 169 (1926) —A description of a series of typical water-bearing strata. K. C. BEESON

Public water supplies of Montana. H. B. FOOTE. *J. Am. Water Works Assoc.* **16,** 197 204(1926) —The waters east of the continental divide are in general of high mineral content while those on the west side are of good chem. quality. D K F.

Conservation and utilization of water resources in Pennsylvania. H. E. MOSES. *Fifth Ann. Rept. Ohio Conference on Water Purification* **1925,** 81–2.—The streams of Penn. for purpose of administration are divided into three classes. Class A streams, relatively unpolluted; Class B streams, polluted which may be reclaimed; Class C streams, polluted which under present conditions it would not be economical to clean up. R. E. GREENFIELD

Iodine content of Pennsylvania water supplies. F. E. DANIELS. *J. Am. Water Works Assoc.* **16,** 227–36(1926).—From an investigation of the I content of certain Pennsylvania supplies and available statistics concerning the prevalence of goiter it seems impossible to establish any direct relation between goiter and the I content of the public water supply D. K. FRENCH

Goiter and the public water supply. H M. JOHNSON. *J. Am. Water Works Assoc.* **16,** 205–6(1926) —A description of the procedure instituted by Anaconda to distribute I through the water supply supplemented by tablets given to the school children D. K. FRENCH

Artesian wells of the Christchurch area. F. W. HILGENDORF. *Trans. Proc. New Zealand Inst.* **56,** 369–82(1924).—Observations of the fluctuations of 8 wells in and near Christchurch, N. Z., for periods ranging from 1 to 14 yrs. show that the wells rise with rain, but the amt. of the rise and the period that intervenes between the rain and the rise depend greatly on the previous weather. While the wells are raised above normal level by rainfall, they are prevented from falling below normal by percolation from the River Waimakariri; and this is true both of the town wells and of the Lincoln wells. The water analyses are consistent with the theory that both town and country wells are fed by percolation from the Waimakariri. A. PAPINEAU-COUTURE

Statistics of water tests (Germany). K. THUMM. *Gas. u Wasserfach* **69,** 753–9 (1926).—Compn., acidity, etc. of various water supplies are listed and discussed. W. B. PLUMMER

The drinking water supplies of Dutch East India. JAN SMIT. *Z. angew. Chem.* **39,** 961–2(1926).—The principal cities are now using water from deep wells, mountain streams, impounding reservoirs and rivers. Slow sand and rapid sand filtration are new and little used. Chlorination is used somewhat. A research lab. has been established at Batavia to study water and sewage problems. K. C. BEESON

Recording "Dionic" water-testing apparatus. ANON. *Engineering* **121,** 773 (1926).—The instrument consists of a vertical glass tube having electrodes at each end and a branch at its lower end connected by rubber tubing to a glass funnel through which the water to be tested is poured until the tube is filled. The instrument measures the quantity of total dissolved solids. It is sensitive to small quantities. The results are affected by temp. K. C. BEESON

Soluble alkalinity of waters used in spinning and new method for determining it. GIOVANNI BARONI. *Giorn. chim. ind. applicata* **7**, 137–40(1925).—The method is as follows: Into a 750-cc. flask of neutral glass introduce 300 cc. of the water to be examd. Heat to boiling for 1 hr. under reflux, avoiding concn. of the liquid, and aspirating through it a current of air freed of CO_2 by previously passing through NaOH. Cool the flask rapidly by immersing it, without removing it from the app., in a vessel contg. circulating water. Stop aspiration; allow to stand 15 min. Draw out the liquid from the flask by means of a siphon, filter through a dry filter and collect in a 250-cc. volumetric flask. Pour this filtered water into a 750-cc. beaker, wash out the flask with a little H_2O, which also pour into the beaker, add 1 cc. 1% phenolphthalein soln., boil briskly over a live flame, and titrate with 0.1 N H_2SO_4 until the pink color does not reappear after prolonged boiling. The titration should take 1/2 hr. Multiply the amts. of H_2SO_4 used by 4 to obtain the sol. alky. in 1 l., or express it in degrees, one degree corresponding to 1 mg. Na_2CO_3 per 1 water; each cc. of H_2SO_4 used corresponds to 5.3 degrees. As a check run through a blank using recently boiled H_2O, to obtain the error due to prolonged boiling in the app. The new method has the following advantages over the one previously used: (1) greater constancy of results and facility of control, (2) simplification of the analytical procedure and reduction to a minimum of the influence of the operator; (3) greater correspondence between the indicated datum of analysis and the degree of alky. which the water assumes in the treating basins; (4) greater rapidity of execution (complete in 2 hrs., while the mere evapn. of 1 l. water in the old method requires not less than 2 days); (5) possibility of carrying out several detns. simultaneously by app. arranged in battery. ROBERT S. POSMONTIER

Meaning of hydrogen-ion concentration and its application to water purification. W. A. TAYLOR. *Fifth Ann. Rept. Ohio Conference Water Purification* **1925**, 68–75.—A discussion of the significance and some of the more common methods of detg. H-ion concn. as applied to water purification and water bacteriology. R. E. GREENFIELD

Chlorination and chlorine-binding power of water. A. MASSINK. *Chem. Weekblad* **23**, 329–34(1926).—A lecture dealing with the results obtained by Wolman (*C. A.* **13**, 1111) on the action of Cl addns. to the city water supply. A variable Cl dose was found to be advisable (cf. Hale, *C. A.* **17**, 1853). The *o*-tolidine method for colorimetric detn. of Cl is further discussed, particularly the influence of p_H on the coloration (excess acid is necessary to make the color stable). Some examples are given from water-works practice, corroborating Wolman's results. B. J. C. VAN DER HOEVEN

Prechlorination of Ohio river water at Ironton water-purification plant. E. T. EDWARDS. *Fifth Ann. Rept. Ohio Conference of Water Purification* **1925**, 51–3.—In an attempt to lower the large bacterial load on the present water-purification plant prechlorination was attempted. Bacteriologically the results were good but tastes due to the phenol-like compds. in the polluted water caused expt. to be abandoned. R. E. G.

Boiler feed water treatment by permutite system. CLARENCE BAHLMAN. *Fifth Ann. Rept. Ohio Conference Water Purification* **1925**, 61–7. R. E. GREENFIELD

Correction of raw water p_H value by means of carbon dioxide at Lima. E. E. SMITH, 2ND. *Fifth Ann. Rept. Ohio Conference on Water Purification* **1925**, 57–9.—The use of CO_2 from a coke burner to lower the high p_H value (8.0–8.3) of the water resulted in a marked saving of coagulant. R. E. GREENFIELD

Methods of recarbonation of lime-soda-softened water. C. P. HOOVER. *Fifth Ann. Rept. Ohio Conference on Water Purification* **1925**, 60–3.—The prevention of after-pptn. is best accomplished by recarbonation with CO_2. The use of other acids is either unsatisfactory or uneconomical. Several methods of generating the gas are available; whatever method is used, it should furnish the gas in a reasonably high concn. and free from impurities which will impart odors or tastes to the water. Automatic devices for measuring and controlling the gas should be provided. R. E. G.

New filtration plant at Walton on Thames. ANON. *Engineer* **142**, 109–12, 134–6, 161–4(1926).—An illustrated account. D. B. DILL

Modern water degasification processes. W. STEINMANN. *Gas u. Wasserfach* **69**, 691–4(1926).—Conditions under which the vacuum process for removing CO_2 from hard waters is applicable are discussed. W. B. PLUMMER

Water purification by the electroösmotic process. VON BEZOLD. *Brennstoff und Warmewirtschaft* **8**, 242–5(1926).—Various examples of complete purification by electroösmosis are given, the cond. of the product being approx. that of com. distd. H_2O (1.5×10^{-5}). In a 15000-l./day app. the following reduction was obtained (all values g./100 l.). $CaCO_3$ 31.0–0.5, Cl 1.0–0.0, SO_3 9.3–0.8, CaO 14.0–0.5, MgO 9.6–0.6. E. m. f. used is 110–220 d. c., and the power consumption about 2 kw.-hr./100 l. of H_2O contg. 20 g. salts/100 l. W. B. PLUMMER

Akron water works system. J. S. Gettrust. *Fifth Ann. Rept. Ohio Conference of Water Purification* **1925**, 46–50.—A description of the past and present water works system of Akron, Ohio. R. E. Greenfield

Effect of fresh color on coagulation at the Cambridge, Massachusetts, water purification works. H. C. Chandler. *J. Am. Water Works Assoc.* **16**, 181–6(1926).—In cold weather good coagulation was hard to get. Pptn. took place too slowly. Another supply of lower color and higher alky. was mixed to the extent of 40% after which coagulation proceeded properly. The presence of algae of a siliceous character and of color in larger and more easily pptd. particles seemed to explain the improved results. D. K. French

Oswestry filter beds of the City of Liverpool waterworks. Anon. *Engineering* **122**, 123(1926).—The water is aerated before it reaches the new filters in order to relieve the filter beds by pre-oxidation of any org. matter and to convert ferrous salts to ferric salts. Aeration and filtration reduce the color from 6.5 to between 3.5 and 3. Filtration alone reduces the color to 3.5. K. C. Beeson

Studies of water purification. IV. The adsorption of neutral salts by Kambara earth. Shu Oikawa. *J Biochem.* (Japan) **6**, 117–28(1926).—Tests with various samples of Kambara earth show that this adsorbs Cl and SO_4 from different neutral salts. Ca is adsorbed sufficiently to make possible the use of this adsorbent for softening potable waters. However, the adsorption of salts is not as great as that of acids. In a mixt. of both the adsorption of the salt is hindered while that of the acid is, generally, increased. S. Morgulis

Comparison of B. coli content in raw and filtered waters in Ohio. F. H. Waring. *Fifth Ann. Rept. Ohio Conference on Water Purification* **1925**, 76–8.—The *B. coli* index of many raw waters used in Ohio exceeds that suggested as a limit by the International Boundary Commission. Well-designed and well-operated water-purification plants are producing satisfactory purified water under such conditions. It is possible that where such conditions exist, eventually an additional step in the water-purification process will be needed. The need for more careful and more extensive bacteriol. examns. in certain water purification plants is pointed out. R. E. Greenfield

Sulfur bacteria as indicators of polluted waters. David Ellis. *Engineering* **122**, 231(1926).—*Beggiatoa alba*, a motile, S-contg., cylindrical filament about 2μ in thickness and a few μ to $^1/_5$ mm in length, appears as a grayish white felty covering on the bed of the stream or pool. In clear water this organism is an indicator of sewage pollution, but in water contg. decompg. org. matter, the growth is probably due to that. K. C. Beeson

The Sanitary District of Chicago, its past, present, and future. E. J. Kelly. *J. Western Soc. Eng.* **31**, 259–60(1926).—An introduction for a series of papers. K. C. Beeson

The sewage-treatment program of the Sanitary District of Chicago. Langdon Pearse. *J. Western Soc. Eng.* **31**, 261(1926).—The removal of all settling solids, and a sufficient biol. treatment to maintain the desired condition in the Illinois River are the aims of the district. The effects of algae growth and storm overflows on the Illinois River are studied. Industrial waste disposal studies such as the effective work at Corn Products are carried out. K. C. Beeson

Chemical and biological investigations of the Sanitary District of Chicago. F. W. Mohlman. *J. Western Soc. Eng.* **31**, 267(1926).—Investigations of the Illinois River are made by the analysis of over 600 samples per day in 6 branch labs. Green algae growths producing O_2 at Lake Peoria often caused a supersatd. condition in the river. "Spiral flow type" aerators and filtrations of sludge with $FeCl_3$ have been tried with considerable success in the activated-sludge process. Packingtown wastes are treated best by activated sludge, tannery wastes by settling and diln. with other sewage, and corn products waste by means of trickling filters. K. C. Beeson

Mechanical engineering features of the sewage treatment works of the Sanitary District of Chicago. H. I. Steffa. *J. Western Soc. Eng.* **31**, 279(1926).—Pumps and air compressors for the treatment plants are described. K. C. Beeson

Electrical engineering features of the Sanitary District, sewage treatment plants of Chicago. J. T. Hawley. *J. Western Soc. Eng.* **31**, 282(1926).—Elec. power and equipment for the various treatment plants are described. K. C. Beeson

Construction of the North Side Sewage Treatment Works (Chicago). L. B. Barker. *J. Western Soc. Eng.* **31**, 284(1926).—The plant is arranged in three batteries, each of 12 aeration tanks and 10 settling tanks. K. C. Beeson

The operation of the Des Plaines River sewage treatment works and small plants of the Sanitary District of Chicago. S. L. Tolman. *J. Western Soc. Eng.* **31**, 287

(1926).—The process removes about 85% of the suspended matter. Effluents contain 5 to 10 p. p. m. suspended matter and 15 to 30 p. p. m. nitrates, and are stable for 10 days. Operation results indicate: that Dorr clarifiers are more desirable than hopper-bottom settling tanks; the desirability of eccentric placing of diffuser plates in aeration tanks; and the need of suitable devices for measuring the air, sewage and sludge. $^1/_{16}$" screens are fine enough. Air should be screened through cloth. K. C. B.

The operation of the Calumet sewage treatment works, Sanitary District of Chicago. A. H. GOODMAN. *J. Western Soc. Eng.* **31,** 290(1926).—The Imhoff-activated-sludge process shows slightly better results than the activated-sludge process using raw sewage. K. C. BEESON

The biological purification of unfermented and fermented sulfite waste liquors. ARNO MÜLLER AND MAX MÜLLER. *Arb. Reichsgesundh.* **57,** 573-9(1926); cf. *C. A.* **8,** 3857; **13,** 1531.—The detn. of nitrate content or O consumption is not adapted for following the biol. purification of mixts of city sewage with unfermented or fermented sulfite waste liquor Samples of sewage from the city of Berlin were treated with approx. 10% of unfermented, or 15% of fermented, sulfite waste liquor, and still purified biologically. These values may possibly be increased somewhat by using a more completely neutralized liquor. FREDERICK C. HAHN

Exact methods for the measurement of air pollution. J. B. C. KERSHAW. *Ind. Chemist* **2,** 153-8(1926) —Eleven reports have been issued by the Advisory Comm. on air pollution (England). K. describes (with illustrations) the kinds of app used in collecting the data contained in these reports (especially soot and dust gages and dust counters), and tabulates the total fall of solid matter in 15 towns and cities and the sol. constituents of the annual rainfall in 9 towns and cities E. G. R. ARDAGH

A calculation of the contamination of streams by potash waste waters (KERP, MERRES) **18.** Removing phenols from waste waters, etc. (Brit. pat. 241,682) **21.**

STEIN, M. F.: **Water Purification Plants and Their Operation.** 3rd ed. revised and enlarged. New York: J. Wiley & Sons, Inc. London: Chapman & Hall, Ltd. 316 pp. 15s.

Water purification. A. L. GRANT. Can. 258,297, Feb. 23, 1926. $BaSiO_3$ is added to heated water contg. $MgCO_3$ to remove scale-forming substances from the water and avoid substitution of foam-producing or sol. salts in the water.

Water purification. T. R. DUGGAN. Can. 258,614, Mar. 2, 1926 In the regeneration of exchange silicates used for softening water, salt soln. is passed through such a used bed, the first portion of the used salt soln being discarded, and a later portion segregated, all or some of the lime and magnesia being removed from said later portion in order to render it suitable for reuse.

Water purification. H. KRIEGSHEIM and W. VAUGHAN. Can 259,207, Mar. 23, 1926. Weak solns. of Na_2SiO_3, and $Al_2(SO_4)_3$, and a soln. of NaCl are successively passed through a bed of raw glauconite.

Apparatus for feeding "boiler compounds." C. W. GIBSON U. S. 1,593,870, July 27.

Purifying sea water for use in aquaria, etc. J. KUNSTLER. Brit. 241,893, Oct. 25, 1924. An app. for filtration and aeration is described.

Preparing exchange silicates for industrial purposes. J. B. WHERRY. Can. 258,561, Mar. 2, 1926. Granulated zeolite is produced from natural clay by producing a slurry from the clay, then alkalizing the slurry, and reducing to dry particles by heating to dehydrate the same and subsequently rehydrating with an alk. metal hydroxide.

Sewage purification tank and gas generator. H. L. THACKWELL. U. S. 1,599,731, Sept. 14

Fumigating with hydrocyanic acid. F. W BRAUN. U. S. 1,597,759, Aug. 31. A fumigating agent is employed comprising HCN and a vapor such as steam which has a higher b. p. and serves to stabilize the HCN and prevent premature condensation.

15—SOILS, FERTILIZERS AND AGRICULTURAL POISONS

J. J. SKINNER

The capillary forces in an ideal soil; correction of the formulas given by W. B. Haines. R. A. FISHER. *J. Agr. Sci.* **16,** 492-503(1926).—Omission of the tension in the air-water interface has introduced an erroneous factor into Haines' formulas (*C. A.*

20, 469); certain additional factors have also crept into his expressions for av. stress. With these corrections the stress due to moisture varies comparatively little with changing water content, though falling slightly throughout the range. The energy required to cause rupture rises continuously in a manner not unlike Haines' measurements and should more probably be associated with them than should the tensile stress. The geometrical approximation used by Haines gives a close geometrical representation of the figure, but a less satisfactory mechanical approximation. Sufficiently exact numerical data are supplied as a basis for the formulas connected with the true curve, and the tables needed to use them. P. R. DAWSON

Aluminum and acid soils. J. LINE. *J. Agr. Sci* **16,** 335–64(1926).—Reconsideration of old evidence and new exptl. work appear to show that the "toxic aluminum" theory of acid soils is no longer tenable. Since the Al of Al salt solns. is pptd. as the hydroxide when the reaction approaches p_H 4.0 and as the phosphate between p_H 3.0 and p_H 4.0, and since only a very small amt. remains in "soln." as the colloidal hydroxide, it would appear impossible for Al to exist as a sol. salt even in very acid soils. Depression in plant growth in culture solns. contg. added Al salts is due either to pptn. of the phosphate or to increased acidity. The latter is maintained by progressive hydrolysis of the salt and is not changed by the plant. When Al salts are added to acid soils the Al is to a large extent rendered insol , but there may be a considerable increase in the acidity, this being least in a well-buffered soil. Depression in plant growth only follows in cases where a H-ion concn. harmful to the particular plant is reached and maintained throughout the growing period. The Al which can be extd. from acid soils by water appears to be present as hydrosol; the amts. are small, 0.001–0 006% of the dry wt. of the soils investigated; such Al does not appear to exert any toxic effect upon barley or any other plant; and its amt is not related to the fertility of the soil. The beneficial effects of lime and phosphatic dressings upon plant growth in naturally acid soils or in those to which Al salts have been added are due solely to their action in reducing the acidity of the soil or in supplying plant nutrients and not to their supposed action in pptg sol. Al. Ca aluminate is not found under the conditions prevailing in any acid soil P. R. DAWSON

Adsorption by activated sugar charcoal with particular reference to soil acidity. E. J. MILLER. Michigan Agr. Expt. Sta., *Tech. Bull.* **73,** 60 pp (1925).—The data obtained in a study of the nature of adsorption by activated sugar charcoal and previously published (*C A.* **16,** 3784; **17,** 2215; **18,** 3508; **19,** 1976, 3138), are presented in collective form and employed as a basis for an explanation and discussion of the nature and origin of soil acidity. The similarity of the behavior of the charcoal and soil systems is pointed out; while the analogies are not perfect, consideration of the results from expts. with charcoal may shed considerable light upon the problem of acidity in soils. Hydrolytic adsorption of the acids of salts with loss of the bases by leaching, the role of surface tension effects in promoting "negative" adsorption of bases, the effect of CO_2 in favoring adsorption of acids, the action of neutral salts in displacing adsorbed acids, and the irreversibility of the adsorption process with the resulting apparent insoly. of such adsorbed acids are all factors which have been demonstrated in the case of charcoal and which may contribute to an explanation of the genesis of acid soils and their properties. P R. DAWSON

The importance of texture in soils. B. C. ASTON. *New Zealand J. Agr.* **33,** 1–5(1926).—A general paper with particular reference to certain New Zealand soils. K. D. JACOB

Soil structure and its significance to agriculture. K. K. GEDROIZ. *Ann. Inst. Exp. Agronomy* (Russia) **4,** 117–27(1926).—The structure of soils, or even horizons of one particular soil, varies There are structureless soils. G. recognizes macro- and microstructure. The latter comprises the complexes of those mechanical elements whose size is beyond the limits of perception with the naked eye. The adhesiveness of the various structural units of the soil is to be studied under dry and humid conditions. Two factors apparently det. structure: pressure and coagulation. At the Nosovsk Exp. Sta. it has been shown that clover converts some structure to structureless chernozem. It is the pressure of the root system that is responsible for the effect on structure. The soil particles capable of coagulation (particles lower than 0.01 mm. belong to this class) are charged negatively; the positive ions of electrolytes are, therefore, the coagulators; the anions are stabilizers. The coagulation power of the cations is as follows: $Li < NH_4 < K < Mg < Ca < H < Al < Fe$. The stabilizing effects of the anions are not sufficient to offset the coagulation effects of the cations. The only exception is the strong OH anions, which hinder coagulation. The process of coagulation is closely connected with the process of replacement and adsorption in the complex capa-

ble of base exchange; this complex is the colloidal fraction of the soil and it is the state of this fraction that dets. the structure of the soil. G. shows how the satn. of the soils with particular cations affects the structure. He cites examples of the various soil regions in Russia, beginning with chernozem and ending with alkali soils. The various soil types are analyzed for their structure; the influence of the colloidal fraction on the various soil types in respect to aeration and water-holding capacity is discussed.
J. S. JOFFE

The influence of forest plantation on the chemical-morphological structure of chernozem. K. P. GORSHENIN. *Pochvovedenie* (Russian) 19, No. 3–4, 41–8(1924).—Forest plantings on chernozem increase at first the amt. of decompd. org. matter in the humus horizon; later, however, the soil loses humus. The increase in humus at first is accompanied by an increase in absorbed Ca but later this Ca decreases; Ca is lost faster than humus. The first goes to the lower horizons; but later even the lower layers begin to lose it; the carbonate layer is also lowered. With forestation the sesquioxides are leached out from the humus horizon. The morphology is changed so that the depth of the humus layer increases at first; then decreases; the clear-cut structure of the humus layer disappears.
J. S. JOFFE

The properties of soil colloids. A. N. SOKOVOLSKII. *Pochvovedenie* (Russian) 19, No. 1–2, 59–79(1924).—Elimination of Ca from soils by replacement brings about a condition whereby extn. of such soils with distd. water brings into pseudo soln. some of the soil colloids. The structure of the soil is destroyed by such treatment. By continuous extns. and decantations a certain fraction of peptized mineral and org. substances may be sepd. By treating the residue with H_2O_2 another peptized fraction may be obtained. The first fraction is known as the active and the second as the passive The absorbed Ca serves as a coagulator of the sols present, and liming serves the purpose of preserving the soil colloids. A German résumé follows.
J. S. JOFFE

The origin of alkali soils. D. G. VILENSKII. *Pochvovedenie* (Russian) 19, No. 1–2, 36–58(1924).—V. investigated the origin of alkali soils and although by a different method, came to the same conclusions as Gedroiz. He formulates his views as follows. (1) Alkali soils are formed from salinized soils, when the latter lose their contact with the ground waters, thus being an old formation, which indicates the existence of a salinized condition some time in the past. (2) The great mass of salinized soils was formed under dry condition after the post-glacial time. (3) The types of alkali soils noticed at present represent distinct stages of the process of successive metamorphosis of the salinized soils under conditions of various climatic zones; the geographic regularity of their distribution shows in what direction this metamorphosis goes.
J. S. J.

The mechanical analyses of soil by the method of decantation with water. M. FILATOV. *Pochvovedenie* (Russian) 20, No. 4, 33–41(1925).—This is a modification of the Sabanin method with a diagram and exptl data showing the value of this method.
J. S. JOFFE

The study of soil plasticity. M. ANTONOVA. *Pochvovedenie* (Russian) 19, No. 1–2, 7–35(1924).—A. detd. in a series of expts the plasticity of various types of soil according to the method of Atterberg (*Inter. Mitt. fur Boden K. I.* 20(1911)). Comparisons are made of plasticity according to types, horizons, the effects of humus, mechanical compn., $CaCO_3$, talc and NaCl. The highest degree of plasticity was found in alkali meadow soils; the chernozem soils high in humus were a close second, followed by loam, sandy and podsol soils. Within the horizons the greatest plasticity was in the humus, followed by the alluvial, alkali and podsolized horizons. Humus up to certain limits increases the binding power and plasticity of soils; above the limits the effect is reversed. The finer-grained soils have a higher plasticity. Addition of sand to a clay soil lowers the plasticity. $CaCO_3$ in clay soils decreases plasticity, increases it in loam and sandy soils. Talc increases the water-holding capacity of soils, but decreases binding power. A comprehensive résumé in German is given.
J. S. JOFFE

The mobility of soil compounds and the influence of calcium on it. K. K. GEDROIZ. Nosovsk (Russia) Agr. Expt. Sta., *Bull.* 43, 1–18(1926).—G. advances his theories on cation replacement and absorption (*C. A.* 18, 1871). He shows how the Ca ion is beneficial in both acid and alk. soils. In the former the Ca prevents the H ion from rendering the soil unsatd., in the latter it prevents the Na from getting into the colloidal fraction of the soil. An exclusive satn. of the soil complex capable of base exchange with Ca locks up the mobile N compds. from the humates as the Ca decreases the dispersion of the particles.
J. S. JOFFE

A borer for sampling soils without destroying their structure. N. KACHINSKII. *Pochvovedenie* (Russian) 20, No. 4, 42–60(1925).—K. gives a critical discussion of the various borers used, illustrating each one with diagrams. As an improvement he finds

the one introduced by Gemmerling and Sabanin, which is a modification of the Kopeck type (*C. A*: 9, 115). A still greater improvement is found in the app. of Nekrasov, Adrianov, Zheligovskii and of Pigulevskii and Zeberg. The improved borers make it possible to det. more accurately the various physical consts. of the soil such as density, moisture-holding capacity, porosity, etc. J. S. Joffe

The significance of nitrogen in soil organic matter relationships. F. J. Sievers and H. F. Holtz. Washington Agr. Expt. Sta., *Bull.* 206, 43 pp.(1926).—All soils are deficient in N in their primary stages of formation and this element can accumulate only as a result of legume fixation, free fixation and pptn. Both N and C exist in the soil very largely as part of the org. matter and as such are always present in a comparatively definite ratio. This N-C ratio is so stable that both N and C content are used as a basis for calcg. soil org. matter. The amt. of org. matter found in any soil is the resultant of accumulation and of loss through decompn., both of which factors are decidedly influenced by climatic conditions, as they exist in nature or are modified by man. Climatic factors that show most pronounced influence on accumulation of org. matter, *viz.*, abundant pptn. and high temp., are also those that are most effective in promoting decompn. Org. matter accumulates in the soil only as a result of the return of plant residues, either in nature or through artificial application and all such residues generally have a wider N-C ratio than soil org. matter. In the process of decompn. of plant residues in the soil there is a tendency for the N-C ratio to be narrowed until it approaches that of the microörganisms responsible for the decompn. The tendency to cause the N-C ratio to become narrower is most pronounced where optimum conditions are provided for the decompn. of soil org. matter and where little or no provision or attempt is made to return plant residues. When org. matter decomposes the C is oxidized and lost as CO_2 and the N undergoes nitrification and is lost mainly through removal by crops or through leaching. As soil org. matter approaches a more advanced stage of decompn. and consequent disintegration there is an increased tendency for it to leach, as is borne out by the narrower N-C ratio of the org. matter found in the subsoil. In this study both the CO_2 evolved and the nitrate accumulated have been used for measuring org. decompn. J. J. Skinner

Determination of the potassium and phosphoric acid requirements of the soil from molecular composition according to Ganssen. Hunnius. *Landw Jahrb.* 63, 145-56 (1926); *Brit. Chem. Abs.* 1926, 378B —H. finds that the method of Ganssen does not give exact fertilizer requirements for all soils. The method of Ganssen is based on the compn. of the Al silicates extd. by boiling HCl. The total content of nutritives and the proportion of colloidal silica are better indicators. This was shown by field expts. The mol. compn. is not directly related to soil reaction. The degree of satn. of sol. silicates is not an exact measure of the exchange acidity. George R. Greenbank

A study of microbiological activities in some Louisiana soils. E. V. Abbott. Louisiana Agr. Expt. Sta., *Bull.* 194, 25 pp.(1926).—In a study of the fungous flora of 3 alluvial soils cropped to sugar cane and 1 loessial soil cropped to cotton, it was found that the genera *Aspergillus* and *Penicillium* constitute 50% of the total flora, 90% of all the fungi isolated belonged to the genera *Aspergillus, Penicillium, Spicaria, Trichoderma, Fusarium, Mucor, Rhizopus* and *Zygorrhynchus*. Members of 28 other genera were isolated *Marasmius* and *Rhizoctonia*, which are known to be present in the soils studied, were isolated infrequently. The total nos. of microörganisms were nearly twice as great in the cane soils as in the cotton soils. Sour clover (*Melilotus indica*) sown on plant cane and plowed under in the spring caused an increase in bacterial nos. which was evident throughout the year. The nos. of fungi and actinomycetes did not seem to be materially affected by this treatment. The sugar cane had a greater nitrifying capacity than the cotton soil, as measured by the nitrification of dried blood and $(NH_4)_2SO_4$. Plowing *Melilotus* into the soil caused an initial increase in nitrate accumulation, but apparently did not affect the nitrifying power of the soil. Application of 3 tons of ground oyster shells per acre to the cotton soil caused an increase in the nitrifying power of the soil. The non-symbiotic N-fixing power of the sugar cane soils was approx. twice as great as that of the cotton soil. *Azotobacter* was plentiful in the cane soils but almost lacking in the cotton soil. J. J. Skinner

The influence of antiseptics on soil ameba in partially sterilized soils. L. B. Severtzov. *Pochvovedenie* (Russian) 20, No. 4, 85-95(1925).—An antiseptic sol. in water kills ameba and bacteria with smaller doses in a soln. than in the soil. CS_2 does not kill cysts of ameba in the soil even when applied in quantity of 60% by wt. 15% ether or 6% $CHCl_3$ did not destroy ameba in the soils studied; nor did 25% CaO or a dose of chlorine of 300 per mille; 15% toluene destroys ameba; 5% CaS does not destroy either cysts of ameba or spores of bacteria; 1.5% CaS failed to kill even non-

spore-forming bacteria. Spore formers have a higher resistance to antiseptics than has ameba. In some cases ameba is more susceptible to antiseptics than are non-spore formers. J. S. JOFFE

An analysis of temperature conditions influencing bacterial activities in the soil in connection with their adaptability to climate. E. MISHUSTIN. *Pochvovedenie* (Russian) **20**, No. 1–2, 43–67(1925).—Soil samples from various climatic zones were used. Ammonification, nitrification, denitrification and urea decompn. were used as indexes for the study. Besides that selective media were used for the isolation of the various groups of microbes. The microbes typical for the northern soils are better adapted to the conditions of low temp. than those from the southern regions. This feature of climate seems to be well fixed and hereditary. The soil microflora may be divided into primary and secondary; the former of uncultivated, the latter of cultivated soils. To the secondary group belong the thermophyllic and urea-decompg. bacteria. The thermophyllic group comprises in general about 1% of the total, although at times they reach the 5% mark. The denitrifiers are more abundantly represented in the thermophyllic group, capable of withstanding a temp of 76°. The mesophyllic group is the most abundant one in the soil J. S JOFFE

Agrological investigations of the dynamics of biochemical processes in podsol soils. S. P. KRAVKOV. *Pochvovedenie* (Russian) **20**, No. 1–2, 5–19(1925).—200 g of soil was extd. with 1 l. H_2O, shaken for 3 min. and filtered through a hard filter. Detns. were made on the content of nitrates, ammonia, total solids, amt of org. and mineral matter, reaction, P, Ca, K, etc Five-year results indicate that notwithstanding variations in meteorological and other conditions the type of curve of nitrate formation in natural soils remains the same The same tendency was noticed in the total solids. It seems that in natural podsol soils the life processes are inert and depressed. J S. JOFFE

The soil as a nutrient medium for agricultural plants. Soil colloids and alkalinity of soils. K. K. GEDROIZ. Nosovsk (Russia) Agr Expt. Sta , *Bull.* **42,** 1–66(1926).—In this monograph G. presents in a popular wav the fundamental properties of soils in general, the chem. properties of the alkali soils in that region, their genesis and the agronomic properties of the chernozem of the same region. J. S. JOFFE

Sunlight and chemical nitrification. I. P. ZHOLTZINSKII *Pochvovedenie* (Russian) **19,** No. 1–2, 80–97(1924) —Cellulose was treated with 100 cc. of hot H_2SO_4 (d. 1.84) and 50 cc. of H_2O, washed, dialyzed and satd with 1 83% NH_3 for 8 days with occasional stirring. The filtrate was dark-colored and contained 0.48 g. humus substances per l. Part of it was subjected to the action of sunlight, part was protected with dark paper and kept in the dark. The dark-colored liquid exposed to the light became light-colored and showed the presence of nitrates. The other fraction kept in the dark showed no change in color and no traces of NO_3 or NO_2 were found. Care was taken to exclude any microbial activities The humic substances serve as a catalyzer for the oxidation of NH_3 into NO_2 and NO_3. The photochemical reactions in the humification process are discussed. Expts with 1–2% soln of org. substances (with and without N) of the benzene structure showed that in photochem. humification H_2O_2 is given off. The process is accompanied by a very active absorption of the rays of the right side of the spectrum. A German résumé follows. J. S. JOFFE

Ridge cultivation in lower Gujarat. B. M. DESAI AND K. B. NAIK. Dept. Agr , Bombay Presidency, *Bull.* **123,** 30 pp.(1926).—In order to det. whether ridging the rows in growing cotton and jowar had any effect on the N content of the soil, samples of surface and subsoil were collected from cropped and uncropped ridges and from adjacent flat land at intervals over a period of one year and analyzed for N present as nitrates and nitrites. In both the surface soil and the subsoil the percentages of nitrates and nitrites were distinctly higher on the ridges than on the adjoining flat land. K. D. J.

The effect of tar and tar vapors on the soil. EWERT *Landw. Jahrb.* **63,** 103–28; *Brit. Chem. Abs.* **1926,** 378–9B.—The more volatile constituents of tar are harmful to plant roots and to soil bacteria. Where the air contains a relatively high proportion of vapors the leaves are injured but not the roots. The leaves are much more sensitive than the roots, a very small quantity having an injurious effect. Tar is shown not to be poisonous to soil as is silica. GEORGE R. GREENBANK

Chemical analysis of soils with respect to fertilizing the vine. H. LAGATU. *Prog. agr. vit.* **85,** 273–5(1926).—Field expts. confirm the conclusion that soil analyses are not adequate for detg. the fertilizer requirements of a given soil for a given crop. The plant itself is the only reliable indicator. P. R. DAWSON

Experiment with nitrogenous salts in vine culture. ED. ZACHAREWICZ. *Prog.*

agr. vit. **85**, 445–6(1926); cf. *C. A.* **19**, 696.—Urea yielded the best results as compared with equiv. amts. of N in other forms. P. R. DAWSON

Experiments with nitrogenous fertilizers on potatoes. LOUIS ROLLAND. *Prog. agr. vit.* **85**, 41–3(1926).—Amts. of the various N fertilizers equiv. to 340 kg. of nitrate per hectare were applied to potatoes in a rather humid season. The yields amounted to 23,300, 21,700, 20,400, 18,200, 17,500 and 15,800 kg. per hectare, for urea, $(NH_4)_2SO_4$, $NaNO_3$, NH_4Cl, check and $CaCN_2$, resp. P. R. DAWSON

Use of calcium nitrate in Forez. CL. PERRET. *Prog. agr. vit.* **85**, 164–5(1926).—$Ca(NO_3)_2$ gave marked increases in yields of potatoes and reduced the amt. of infection by a blight prevalent in the region. P. R. DAWSON

Fertilizing action of calcium carbonate. E. TRUNINGER. *Landw. Jahrb. Schweiz.* **39**, 807–42; *Brit. Chem. Abs.* **1926**, 415–6B.—$CaCO_3$ has a different action upon acid and non-acid soils which is due to the difference in adsorption and decompn. The higher the acidity the greater the risk of the injurious effect of $CaCO_3$ Therefore, $CaCO_3$ should not be used in conjunction with phosphatic fertilizers. The high adsorption of hydroxyl ions by soil colloids protects against excess alky. G. R. G.

Sugar-beet experiments, 1925. ANON. *J. Dept. Lands and Agricul ure, Ireland* **26**, 19–45(1926).—$NaNO_3$ applied to sugar beets as a top dressing at the rate of 100–300 lbs. per acre did not appreciably effect either the yield or sugar content of the beets grown on a fertile soil. German and Dutch varieties of beets were definitely superior to French and Danish varieties with respect to the av. sugar content, but in general the heaviest yields per acre were obtained with the French variety. The sugar content of beets grown on heavy and peaty soils was lower than that of beets grown on light soils The date of the sowing of the seed bore no relation to either the yield or sugar content of the beets but the date of thinning after sowing had a definite effect on the percentage of sugar, plants thinned at a "late" date giving higher yields of sugar than those thinned at "normal" and "very late" dates. Well-cultivated beets gave higher yields of sugar than those kept in a bad state of cultivation and the av. sugar content was somewhat higher in beets grown in drills 21 in. apart than in those grown in drills 18, 24 or 27 in. apart. K. D. JACOB

Laboratory experiments with arsenicals in the control of the codling moth. E. J. NEWCOMER. *J. Agr. Research* **33**, 317–30(1926).—See *C. A.* **20**, 1489 W. H. ROSS

A chemical investigation of some standard spray mixtures. R. E. ANDREW AND P GORMAN. Connecticut Agr. Expt. Sta , *Bull.* **278**, 491–507(1926).—The Ramberg method of detg. small quantities of As has been found adaptable to the detn. of sol. As in spray mixts. Lime-sulfur reacts strongly with Pb arsenate, giving increased sol. As and decreased S in soln. It reacts similarly with Pb arsenate and nicotine sulfate in combination and with Pb arsenate and casein-lime but the reaction is not as great in the latter case. Nicotine sulfate does not react with Pb arsenate or with lime-sulfur so far as indicated by the chem. data; a color change is noted, the significance of. which is not explained. When added to Pb arsenate and casein-lime together, the sol. As is increased; added to Pb arsenate and lime-sulfur together there is a marked decrease in sol. As and also a decrease in the amt. of S in soln. When added to triple combinations of Pb arsenate, casein-lime and lime-sulfur variable results are noted. Casein-lime increases the sol As content of Pb arsenate when mixed with it alone. When mixed with lime-sulfur alone the amt. of S in soln. is somewhat reduced. When added to nicotine sulfate and Pb arsenate the sol. As is distinctly increased, but when added to lime-sulfur and nicotine sulfate the S content of the soln. is not greatly altered In quadruple mixts. there is, in general, an increase of S in soln. due to the casein-lime and there is in general a decrease in sol. As. The latter, however, may sometimes be increased The lime in casein-lime is largely responsible for the decrease in sol. As where this material is used. Different orders of mixing quadruple mixts. give different results, but so many factors are involved and the variations are so small that the selection of improved mixts. seems an impossibility. Colloidal S is sometimes formed in the spray mixts. The color of the resulting mixt. is not a satisfactory means of judging a spray soln. J. J. SKINNER

Arsenic in apples. D. H. ROBINSON. *Fertilizer, Feeding-stuffs and Farm Supplies J.* **11**, 600–1(1926).—Samples from certain shipments of American apples sold in the English market were found to contain 0.033 to 0.1 grains of As per lb. while English apples contained much smaller amts. The presence of As was due to the use of Pb arsenate in spraying for control of the codling moth, the larger amts. in American apples being attributed to the fact that several sprayings are necessary to control second broods of the moth while in England one spraying is usually sufficient. Also rainfall in the English districts is usually greater during the growing season than in America. Serious

contamination of fruit by the use of As sprays may be prevented by the exercise of reasonable precaution. K. D. JACOBS

Studies on the etiology of sugar-cane froghopper blight in Trinidad. I. Introduction and general survey. C. L. WITHYCOMBE. *Ann. Appl. Biol.* **13**, 64–108 (1926).—This froghopper (*Monecphora saccharina*), a serious pest of cane in Trinidad, voids a fluid which is slightly alk. (p_H 7.6) contg. various salts including phosphates but apparently no reducing or other sugars. The saliva has a diastatic action on starch, contains oxidases, and is slightly acid (p_H 6.0–6.2). The effect of the feeding of this insect on the cane leaf is described. The H_2O relations of the plant are probably important in recovery from injury due to froghoppers and retardation of the spread of injurious effects. Fertilizers do not aid recovery. The bionomics of the froghopper are briefly considered and suggestions for future investigations are given. C. H. R.

Fumigation of tomato houses with hydrocyanic acid gas. E. R. SPEYER AND O. OWEN. *Ann. Appl. Biol.* 13, 144–7(1926).—Dry powdered $NaHCO_3$ and finely divided NaCN (98%) are mixed in the proportion of 3 to 1 by wt. One oz. of the mixt. is used to each 1000 cu. ft. of greenhouse space. It is distributed along the paths in the greenhouse, which must be dry. The generation of HCN from the mixt. is slow. C H. R.

Wheat pickles. E. W. PRITCHARD. *J. Dept. Agr. S. Australia* 29, 781-6(1926).—A 1% soln of $CuSO_4$ has a small detrimental effect upon the germination of sound wheat grains. Damaged grain, however, is much more affected. Formaldehyde (1 lb. 40% HCHO to 40 gals. H_2O) has a slight beneficial effect upon sound grains and a neutral effect upon damaged grain. $CuCO_3$ at the rate of 1 lb. to 8 bu. of wheat has a neutral effect upon germination of sound grain, but a pronounced detrimental effect upon damaged grains. M. S. ANDERSON

Influence of varied fertilization on the quantity of useful constituents of coriander, anise, chamomile and paprika (DAFERT, RUDOLF) **17.** The rubber industry in Mindanao [rubber soils] (GALANG) **30.** S (for fungicide and fertilizer) as a by-product of gas (GEIGER) **21.** The fertilizer plants of the Sulphide Corporation, Ltd., at Cockle Creek, N. S. W. (ANON) **18.** Cocoa by-products and their utilization as fertilizer materials (WALTON, GARDINER) **12.** Podsol in South Saghalien (WAKIMIZU) **8.** Russian flax literature for 1925 (TOBLER) **25.** Fertilizer from fermentation residues (U. S. pat. 1,599,185) **16.**

Fertilizer. F. W. FREISE. U. S. 1,599,226, Sept. 7. A fertilizer material such as the reaction product of phosphate rock, Ca cyanamide and H_2SO_4 is mixed with $(NH_4)_2SO_4$ as it comes from the den and allowed to cure to render the mass dry and granular.

Fertilizer. G. BARSKY. U. S. 1,599,198, Sept. 7. In order to avoid fire risk in prepg. fertilizer contg. $NaNO_3$ or other nitrate, less than 50% of Ca cyanamide is added.

Fertilizer. J. M. BRAHAM and F. E. ALLISON. U. S. 1,598,638, Sept. 7. A cyanamide is used in admixt. with calcined phosphate obtained by calcining a mixt. of phosphate rock, an alkali metal salt and carbonaceous matter.

Fertilizer. W H. ROSS, R. M. JONES and A. L. MEHRING. U. S 1,598,259, Aug. 31. A mixt. comprising phosphate rock, a K silicate and carbonaceous material is ignited in a reducing atm. at 1300°, the evolved fume is burned as it escapes and the resulting product is recovered by elec. pptn.

Fertilizer. J. S G. TELFER. Can. 258,552, Mar. 2, 1926. A fertilizer which comprises the following ingredients is pulverized and mixed together in the dry state, in the proportions specified by weight: $(NH_4)_2HPO_4$ 6, $(NH_4)_2SO_4$ 4, desiccated $NaNO_3$ 4, KNO_3 4, $CaCO_3$ 2, kainite (dried) 1, NH_4NO_3 2, K_2CO_3 2 parts total 25 parts by weight. Cf. *C. A.* **19**, 3559.

Fermentation of organic matter to prepare a fertilizer. E. P. COOKE. U. S. 1,597,-724, Aug. 31. In order to render the N available in materials such as garbage they are confined within a chamber to which air is supplied to promote the activity of microorganisms and the temp. of the air is suitably regulated. U. S. 1,597,725 specifies a similar process in which the air is preheated by the heat of fermentation.

Arsenate. J. F. CULLEN. Can. 260,509, May 4, 1926. The manuf. of Ca arsenate insecticide consists in the intermixt. with Ca arsenate of comparatively high water soly. and contg. a high percentage of arsenic acid as compared with CaO, of sufficient CaO to secure the required low water soly. and of sufficient inert material to secure the required percentage of arsenic acid in the final product.

Leucite treatment. W. R. ORMANDY and A. M. PEAKE. Can. 261,843, June 22, 1926. In the manuf. of fertilizers, silicates are allowed to react with natural phosphate rock, $CaCO_3$ and H_2SO_4.

Insecticide. J. S. Cohen and A. B. Leerburger. U. S. 1,599,809, Sept. 14. A stable insecticidal ester is formed by interaction between aliphatic alcs. such as MeOH, EtOH or iso-PrOH and carbonic acid. Et_2CO_3 may, *e. g.*, be used with a soap soln.

Insectifuge. F. D. Terry. U. S. 1,599,851, Sept. 14. A liquid for repelling flies and other insects comprises a clear homogeneous mineral oil such as gasoline which is readily volatilizable when sprayed in small quantities at ordinary atm. temp. and pressure, assocd. with the volatile active principles of pyrethrum.

Insecticide. R. B. Derr. U. S. 1,598,269, Aug. 31. Soap bark and dextrin are used as a "spreader" with arsenates, S or other insecticides.

Insect-repelling compound. J. A. Asselin. Can. 260,009, Apr 20, 1926. A compd. composed of vegetable oil, H_3BO_3, $Na_2B_4O_7$, vegetable pine tar, citronella oil, alc., vaseline, parowax and a perfume.

Fungicide containing copper. C. A. Newhall. U. S 1,598,982, Sept. 7. A basic salt of Cu is prepd. by treating $CuSO_4$ with milk of lime or NaOH free from carbonate, heating to about 60° and drying. It has great bulk and adhering power and an apparent sp. gr. of 3.7.

Fungicides for treating seeds. Farbwerke vorm. Meister, Lucius & Brüning. Brit. 241,568, Oct. 15, 1924. Cu or Hg compds or other fungicides for treating seed wheat or other seeds are mixed with a small proportion of oil to prevent dust from rising during the treatment and use of the seeds.

16—THE FERMENTATION INDUSTRIES

C. N. FREY

Detection of ethyl phthalate as a denaturing agent in alcohol. H. Thoms. *Apoth. Ztg.* **39,** 1426–7(1924).—Fifty cc. of alc. are evapd. to dryness with 5 cc. of 10% NaOH soln., the residue is treated with 3 cc. of concd. H_2SO_4, cooled, treated with 0.05 g. of freshly sublimed resorcinol, heated for 5 min. at 80°, and cooled. Four drops are poured into 3 cc. of 10% NH_3 and 10 cc. of water. After standing for 10 min., a yellow-green fluorescence shows the presence of Et phthalate (0.5 mg. of phthalic acid gives a positive reaction). Under similar conditions α-naphthol gives a sky-blue, β-naphthol a feeble sea-blue, color. The phthalic acid may be sepd. thus: 500 cc. of alc. are evapd. to dryness with 25 cc. of 10% NaOH, the residue is slightly acidified with HCl, concd., extd. with a mixt. of alc. and ether, the ext. evapd., and the residue sublimed, when phthalic anhydride is obtained. B. C. A.

Soluble starch and the function of lactic acid in brewing. A. Vervoort. *Petit j. brasseur* **33,** 1048–51(1926); *Chimie et industrie* **16,** 296(1926).—The presence of sol. starch in beer is of no importance, as it is found in both lambick and Louvain beers. The presence of degradation products intermediate between starch and dextrins, which react with I, is harmful as it gives insufficient degree of fermentation and predisposes to bacterial infection. The opalescence of Louvain beer is due not to sol. starch but to albuminoids and its stability is due to lactic acid, and the latter also accounts partly for the characteristic flavor of lambick. During the course of prolonged fermentation (2 yrs.) the sol. starch degrades and is used as food by the useful enzymes. Lactic acid also acts as stabilizer. There is therefore analogy between Louvain beer and lambick. A. Papineau-Couture

The sweetening of beers. Ch. Parfait. *Bull. inst. sup. ferm. Gand* **27;** *Ann. soc. brasseurs* **35,** 300–7(1926).—Tests were carried out by addn. of 5% sucrose, after the primary fermentation, to beers prepd. with 9 different yeasts, both top and bottom fermentation. From 20 to 24% of the total sol. N was eliminated during the primary fermentation, which had increased to 24–29% after the secondary fermentation, the increased N elimination improving the stability of the beer. The secondary fermentation increased the alc. content by about 75%, thereby increasing its resistance to infection. As the sucrose is not completely fermented, there remains a sweet taste which is characteristic of certain special beers. The vigorous evolution of CO_2 during the secondary fermentation carries off the yeasty taste which persists for quite a long time in beers which undergo a slow secondary fermentation. A. Papineau-Couture

Use of hydrogen peroxide in the brewery, particularly for improving the germinating power of barleys. Becker. *Z. ges. Brauw.* No. 9, May 1, 1926; *Brasserie et malterie* **16,** 164–9(1926).—Results of both lab.-scale and com. tests showed that treatment with H_2O_2 had a greater beneficial effect on the germinating power of barleys than drying and

treatment with lime water. As a disinfectant for breweries it offers no advantages over the disinfectants in general use. A. PAPINEAU-COUTURE

Vierka yeasts. E. GILG AND P. N. SCHÜRHOFF *Pharm. Ztg.* **71**, 940–2(1926).—An exptl. discussion of the utility of "Vierka-Hefen" in the production of wines like sherry, Johannisberger, Burgundy, Niersteiner, Laubenheimer and Bernkastler. W. O. E.

Extraction of tartaric acid products from marcs, lees and weak wines. J. VENTRE. *Prog. agr vit.* **85**, 299–303, 328–32, 371–3, 418–25(1926).—A discussion of the economic considerations and methods involved in recovering tartaric acid, cream of tartar, etc. from wine by-products. P. R. DAWSON

The tartar number of natural, abnormal wines of Gard, Ardèche and Loir-et-Cher. FONZES-DIACON. *Ann. fals.* **19**, 416–8(1926); cf. *C. A.* **20**, 794.—F.-D.'s rule for the differentiation of natural abnormal wines and of watered wines is shown to apply successfully in the analyses of wines of known origin published by Aubouy (*Ann. fals.* **19**, 283(1926)) A. PAPINEAU-COUTURE

Grape pectins and the mellowness of wines. L. SEMICHON AND FLANZY. *Compt. rend* **183**, 394–6(1926) —A pectin ppt. free from impurities is obtained by adding 1% HCl to the must or wine before pptg. with alc. The alc ppt. is redissolved in H_2O, pectic acid is recovered as Ca pectate by a slight modification of Carré and Haynes' method and the gums are repptd by alc in the filtrate Grape musts contain only pectins and wines always contain gums, either alone or with pectins The pectin ppt. is a Me ester of pectic acid combined with other org compds. and with inorg. constituents The ppt. from a typical grenache must gave OMe (as MeOH) 12 86, pectic nucleus (of which 69 60 pectic acid and 11 83% other org. compds) 81 43, ash 5 71%. Hydrolysis of the pectic nucleus gave a soln. contg. a C_5 sugar, probably arabinose The ash consisted of P_2O_5, CaO, MgO, Al_2O_3 and a trace of Fe Hydrolysis of the gums in wine gave glucose In grapes, as in apple pomace, pectose or insol protopectin seems to be due to a disintegration of the cellulosic tissues Unduly high acidity in grapes interferes with the action of pectose and its transformation into sol. pectin. This transformation takes place only toward the end of the ripening, and especially during over-ripening and sun-drying of the grapes. Contrary to Müntz and Lainé, the gums are not formed by disintegration of the pectins; nor have they a bacterial origin. They appear to be a waste product of the vegetative processes in yeast. Pectins allow of distinguishing between natural liqueur wines obtained by over-ripening and sun-drying of the grapes from liqueur wines obtained by artificial concn. of the must Gums distinguish partially fermented liqueur wines from those fortified with alc. The pectin content varies with the vines: those which sun-dry readily give musts rich in pectin and mellow wines; while those which do not readily sun-dry give musts low in pectin and wines which are dry and lack mellowness. Dextran, formed by *Botrytis cinerea* on Sauternes grapes, differs from pectins both in properties and in constitution. Dry wines can be mellowed by heating the fresh grape skins with part of the must; the acidity converts the pectose into sol. pectin. The mellowness is related to the increase of the fruity aroma, which is apparently favored by dissocn. of the methyl pectic ester, the liberation of the OMe radical and its combination with the essential oils and oleoresins contained in the grapes. A. PAPINEAU-COUTURE

FABRE, J. HENRI **L'analyse des vins et l'interprétation des résultats analytiques en vue des transactions commerciales ainsi que de la répression des fraudes.** 300 pp. 30 francs. Reviewed in *Ann. fals.* **19**, 423–4(1926).

Dealcoholizing beverages. C. H. CASPAR. U. S. 1,598,601, Sept. 7. In effecting alc. fermentation, the fermenting liquid is circulated through the gases and vapors generated by the fermentation, and the alc. is condensed from the gases and vapors, the temp. of the liquid being maintained below the b. p.

Alcohol, organic acids and fertilizer from fermentation residues. G. T REICH. U. S 1,599,185, Sept. 7. Liquid obtained by the alc. fermentation of dild. molasses or the like is fractionated to obtain a fraction contg. most of the alc., another fraction free from alc. and a residue. The fraction practically free from alc. is used together with part of the residue for dilg. additional saccharin matter to be fermented. The final distn. residue may be calcined and worked up with alc. and inorg. acid to obtain esters of org. acids or otherwise treated for recovery of the latter, leaving a material for use as a fertilizer.

Yeast. R. HAMBURGER, S. KAESZ and F. HARTIG Can. 258,458, Mar. 2, 1926.

A setting is prepd. on a portion which contains a higher proportion of nitrogenous yeast food than the main quantity of the nutrient medium; the starting yeast is added and subjected to a short preliminary fermentation while aerating to such an extent that only a small part of the sugar present in this setting will be consumed by fermentation; then the diln. of the said portion is increased and thereafter the regular supply of the main quantity of the nutrient medium is used at the rate of consumption of the nourishing substances of the yeast, while vigorous aeration sets in.

Yeast. R. HAMBURGER, S. KAESZ and F. HARTIG. Can. 258,457, Mar. 2, 1926. Yeast is exposed, after sepn. from the culture medium, to the action of a smaller quantity of a nutrient soln. offering carbohydrate compds. and nitrogenous food to the yeast at a ratio similar to that existing in the culture medium in the initial phases of fermentation, and the yeast is then sepd. from the soln.

Yeast. R. HAMBURGER, S. KAESZ and F. HARTIG. Can. 258,456, Mar. 2, 1926. Nitrogenous yeast food is supplied to the nutrient medium by interaction of lactate of lime and $(NH_4)_2SO_4$; the ppt. of $CaSO_4$ is then eliminated from the liquid.

Yeast. L. J. J. LINDEMANN. U. S. 1,596,279, Aug. 17 With a purpose of improving the durability of yeast the fresh yeast is washed in H_2O which may be rendered alk. with $Ca(OH)_2$ at a temp. of 33–43° until tests show that at least nearly all the glycogen is removed

Preserving and drying yeast. J. H. MACKINTOSH. U. S. 1,596,983, Aug. 24. Compressed yeast is mixed with a sugar-contg. material such as molasses and the mixt. is heated so that fermentation is quickly set up and a rapid drying ensues, assisted by the escape of fermentation gases.

Nitrogenous yeast food. O. HAMBURGER. Can. 258,494, Mar. 2, 1926. A current of steam is blown into the animal waste suspended in water with an addn. of lime, the soln left as residue in the heating vessel is then sepd from the undissolved matter.

17—PHARMACEUTICAL CHEMISTRY

W O. EMERY

Determination of the alcohol content of tinctures. J. GADAMER AND E. NEUHOFF. *Apoth. Ztg* **40,** 936–8(1925).—For alc detns., tinctures are dild. with water and distd. The distillate is treated with K_2CO_3 according to the method of Nag and Lal (*C. A.* **13,** 2832), whereby the hydrate, $4C_2H_5OH.H_2O$, is sepd. and measured volumetrically. Certain tinctures (*catechu, cinnamon, Quillaioe, Ratanh., Tormentill., Iodi*) required preliminary treatment before distn. B. C. A.

Anise oil and star-anise oil. W. ZIMMERMANN. *Apoth. Ztg.* **40,** 1344–5(1925).—The HCl test with pure anise oil, star-anise oil, and mixts. of the 2 does not give trustworthy results and the following is suggested. Five drops of a vanillin soln. (0.4 g. of vanillin in 5 g. of dil alc.) are mixed with 2–3 drops of the oil, and fuming HCl is added to make 1 cc. The color is first observed in the cold, then in a water bath at 50°, which is slowly heated to boiling. Freshly distd. anise oil becomes pale red on warming and finally brownish red, which remains on cooling. Star-anise oil on warming gradually becomes pale green, then grass-green, and on boiling brownish green; on cooling, olive-green. With a mixt. of anise oil and 10% of star-anise oil a dirty green color is obtained, and with 30% of star-anise oil the color produced by the anise oil is entirely masked. B. C. A.

Natural musk. ALFRED WAGNER. *Chem.-Ztg.* **50,** 601–3(1926).—A recapitulation of our present-day knowledge of this animal product, notably the nature and source of supply, the several com. brands, compn., application in perfumery and medicine, prepn. of the infusion and tincture, tests for purity and economic data. W. O. E.

Influence of varied fertilization on the quantity of useful constituents of coriander, anise, chamomile and paprika. O. DAFERT AND J. RUDOLF. *Heil- und Gewürz-Pflanzen* **8,** 83–92(1925).—A summary of the exptl. findings shows in general that the methods of fertilization described in detail lead to an increase in production of the active constituents of coriander, anise and paprika, while the behavior of chamomile toward fertilizers corresponds to the commonly accepted plant-physiological laws. The former observation has its counterpart in the fertilization of the saponaria, the latter in that of black mustard (yields of saponin and essential oil, resp.). W. O. E.

Hemolytic estimation of minute quantities of essential oils in drugs. O. DAFERT AND R. KWIZDA. *Heil- und Gewürz-Pflanzen* **8,** 129–34(1925).—The hemolysis of a 2% suspension of rat blood in physiol. NaCl soln. by a 85% EtOH alone and by an alc.

soln. of melissa oil has been studied. The hemolytic index of this oil is 3300 as compared with 18,200 for Merck's saponin. W. O. E.

Hungarian drugs. ADAM BOROS. *Heil- und Gewürz-Pflanzen* **9**, 46–50(1926).—Various substitutes for the following drugs are suggested: *Flores calcatrippae, althaeae, verbasci, primulae; Herba plantaginis, achilleae, centaurii, serpylli, menthae; Radix hellebori nigri.* Interesting cases of adulteration and characteristic occurrence of foreign material in Hungarian drugs are cited. W. O. E.

Alkaloidal content of Datura stramonium. JANOS KUNTZ. *Heil- und Gewürz-Pflanzen* **9**, 51–2(1926).—An unusually large plant (180 cm. high, 220 cm. broad, 47 cm. root length, wt. of plant green 7800 g., dry 1410 g.) contained a total of 2.2764 g. alkaloids of which 0.1530 g. occurred in the root, 0.5000 g in the stems, 0.5530 g. in the leaves and 1 0704 g. in the unripe fruit W. O. E.

Drug plant culture in Eckerberg during 1923-25. W. BÖHMER. *Heil- und Gewürz-Pflanzen* **9**, 53–61(1926).—Among the plants described are: *Mentha piperita, Melissa officinalis, Salvia officinalis, Origanum majorana, Artemisia absynthium, Datura stramonium, Atropa belladonna, Verbascum thapsiforme, Althaea rosea var. nigra, Anthemis nobilis, Matricaria chamomilla, Lavendula vera, Foeniculum vulgare.* W. O. E.

German fennel culture. ERNST SCHMIDT *Heil- und Gewürz-Pflanzen* **9**, 62–3 (1926). Descriptive. W. O. E.

Drug plant culture in East Prussia. HANS ROSTEK. *Heil- und Gewürz Pflanzen* **9**, 63–5(1926).—Descriptive W. O. E.

Oil of Hydnocarpus illicifolia. A. MARCAN. *J. Soc. Chem. Ind.* **45**, 305–6T (1926).—Since there is no known method of detg. the % of hydnocarpic and chaulmoogric acids in oils of this character—their therapy being largely empirical—the analytical values of the new oil were compared with those of an oil of the chaulmoogric group of proved value in the treatment of leprosy. For this purpose the oil of *Hydnocarpus anthelmintica* was selected. The consts. of the cold-pressed oils of *H illicifolia* and *H. anthelmintica* (the latter being parenthesized and showing limits of values of 23 samples) were found to be: m. 23 0–28 2° (20.2–23 4°), acid value, as oleic acid % 0.6 (0 2–9.8), d_4^{20} 0 917 (0.943–0.950), sapon. value 213 1 (191 4–226.5), I value Wijs 89.7 (88 6–99 6), $[\alpha]_D^{30}$ 51.2 (47.1–51.5), n_D^{30} 1.4763 (1.4733–1 4753). The insol fatty acids and their mixed esters were prepd and fractionated, and the consts. detd. and compared in each case. From the exptl. findings the conclusion is drawn that the oil of *H illicifolia*, which could be produced in large quantities in Siam, is very likely to be of value in the treatment of leprosy. To this end mixed Et esters of this oil are being examd. by competent medical authority. W. O. E.

Geraniol and its quantitative determination—citronellol. L. GUY RADCLIFFE AND EDWARD CHADDERTON. *Perfumery Essent. Oil Record* **17**, 254–64, 350–5(1926).—An exptl. consideration of methods for the detn. of geraniol and citronellol. When compared with Schimmel's process for the estn. of free geraniol in a citronella oil, Verley's and Bölsing's method possesses the following advantages: Esterification of geraniol is almost quant. A great saving of time is effected on account of the following factors: (*a*) Verley and Bölsing's method requires only 15 minutes' heating, whereas with Schimmel's method a period of 2 hours' duration is necessary: (*b*) Only 1 weighing is required per flask—that of the oil. In addn. the phthalic anhydride must be accurately weighed into each flask when Schimmel's process is used. (*c*) In this method also the excess of anhydride is taken up by the addn. of KOH soln., the excess of which is in turn neutralized by back-titration with H_2SO_4. By the method under discussion such operation is unnecessary since the excess of anhydride is directly neutralized with KOH. This not only effects a saving in time but reduces considerably certain possible sources of exptl. error. (*d*) The calcn. of results is a shorter and much less tedious process. From a large no. of expts. the following conclusions were drawn: (1) The detn. of geraniol in com. geraniol is best effected by the acetylation process. (2) The same holds likewise in detg. citronellol in the com. product. (3) In detg geraniol in the presence of citronellal, the acetylation process is useless. Any of the following 3 methods may, however, be used, *i. e.*, Schimmel's, Verley's and Bölsing's, as also the pyridine anhydride methods. (4) In detg. citronellol in geranium oils the formylation process is unsatisfactory. It would appear that the isolation of citronellol *via* Tiemann and Schmidt (PCl_3 method) would present a much more satisfactory figure, but apparently the success of this sepn. is dependent upon the use of a comparatively large bulk of oil, as otherwise loss of the isolated citronellol due to the vessels used becomes a source of serious exptl. error. W. O. E.

Estimation of total alkaloids in cinchona bark. O. DAFERT AND HERMA VLCEK.

Pharm. Monatshefte **7**, 131–5(1926).—A critical study of prevailing pharmacopeial and other methods shows that it is possible even with small quantities of sample and of reagent to obtain correct results. In sepg. the aq. from the org. solns. recourse must be had to H_2O absorbents on account of the small volumes of liquid involved. Resort to such agents shortens furthermore the time of operation. In this connection tragacanth is preferable to plaster of Paris. A new modification of Dieterle's method is suggested, whereby titration is effected with 0.01 instead of 0.1 *N* solns. W. O. E.

Acidimetric and rhodanometric estimation of mercuric chloride tablets. E. RUPP, K. MÜLLER AND P. MAISS. *Pharm. Zentralhalle* **67**, 529–31(1926).—*Acidimetric evaluation.*—Dissolve 2 tablets (0.5 g. strength) or 1 tablet (1 g $HgCl_2$) in 100 cc. of H_2O, transfer 20 cc. (= 0.2 g.) to a titration beaker contg. 25 cc. of 0.1 *N* alkali and 15 to 20 drops of perhydrol (or 10 cc. of 3% acid-free or neutral H_2O_2), then oscillate above a small flame until the HgO has become completely gray and the eosin-red color has disappeared (3 to 5 min. at 45° to 50°). After cooling, dil. by washing the neck and walls of the beaker with 40 to 50 cc of H_2O, add 2 to 3 drops of methyl red soln. and titrate with 0.1 *N* HCl to a change in color. One cc. of 0.1 *N* NaOH = 0.1357 g. $HgCl_2$. *Rhodanometric evaluation.*—To an Erlenmeyer flask contg. about 25 cc. of alk. H_2O_2 soln. (about 20 drops of perhydrol and 15% alkali) gradually add 20 cc. of H_2O contg. up to 0.3 g. $HgCl_2$ sample, and warm over a small flame. After complete sepn. of gray Hg add 10 to 15 cc. of 25% HCl and again warm the product, tilting the flask the while until the Hg collects in a globule (3 to 5 min.). Pour off the supernatant liquid, wash the residual Hg until free from Cl, then dissolve in Cl-free HNO_3 (1.4), add drop by drop 1% $KMnO_4$ soln. to a permanent pink color, discharge the latter with a crystal of $FeSO_4$, then after the addn. of Fe alum soln. (and if necessary 5 to 10 cc. of dil. HNO_3 to inhibit Fe^{III} hydrolysis) titrate with 0.1 *N* NH_4CNS soln. to a rusty brown. One cc. of 0.1 *N* NH_4CNS = 0.01003 g. Hg and 0.01357 g. $HgCl_2$, resp. W. O. E.

Betilon. R. WOLTER. *Pharm. Ztg.* **71**, 923(1926).—A new deriv. of mandelic acid contg. the benzyl and sulfonate groups, and alleged to be efficacious in the treatment of certain diseases like obstipation, colic, dysmenorrhea, asthma, angina pectoris, etc W. O. E.

A glimpse of the assays of the pharmacopeia. E. J. HUGHES. *Am. J. Pharm.* **98**, 465–71(1926).—A brief and general presentation of the principles involved in the official analytical procedures that are used in testing and assaying the official drugs and chemicals. W. G. GAESSLER

The official titles of the silver proteins. JOS. W. E. HARRISSON. *Am. J. Pharm.* **98**, 480–1(1926).—H. explains that although the compd. which bears the title of *mild* Ag protein contains 19 to 25% Ag, while that bearing the title *strong* Ag protein contains much less, namely, 7.5 to 8.5%, the title is not based on the content of the Ag, but on the therapeutic properties of the compd. which are due to the ionizable Ag content. They have acquired the titles they bear as their physiol. action compares with $AgNO_3$. Those contg. the smaller quantity of total Ag, that is 7.5 to 8.5%, belong to the "strong Ag-proteins" because they produce an irritation of the mucous membrane when applied, by virtue of the fact that their "ionizable" Ag content is much higher than that of the "mild Ag-proteins" (contg. 19 to 25% Ag) which have a demulcent action, and do not irritate even in very concd. solns. W. G. GAESSLER

The chemistry of perfumes. JUSTIN DUPONT. *Am. Perfumer* **21**, 367–70(1926).—A review. E. H.

Clinical experiences with a new morphine derivative (Dilaudid). E. W. TASCHENBERG. *Deut. med. Wochschr.* **52**, 1477(1926).—Dilaudid, a com. prepn. of morphine in which an alcoholic OH group is replaced by a keto group, was found to be beneficial as an analgesic and anodyne. ARTHUR GROLLMAN

A new kino from Tanganyika. ANON. *Bull. Imp. Inst.* **24**, 221–3(1926).—A sample of kino obtained from Usoke, Tabora District, Tanganyika and derived from "Mninga" (*Pterocarpus Bussei*) gave the following results: H_2O 9.7, insol. matter 0.7, extractive matter (non-tannin) 12.9, tannin 76.7, ash 1.5%; tintometer readings—red 3.0, yellow 3.8. It is of similar compn. to ordinary Malabar kino and complies with B. P. requirements, except that it is not the product of *P. Marsupium*. A. P.-C.

Java oil of citronella. W. BOBILOFF. *Parfums de France* **4**, 246–52(1926). (In French and English.)—The method used in the lab. of the Dept. of Agriculture at Buitenzorg, Java, for the detn. of total geraniol is: boil gently 10 cc. of oil, 10 cc. of 95% Ac_2O and 2 g. anhyd. AcONa in the presence of a few small pieces of pumice for 2 hrs. in a Kjeldahl flask with an air condenser, avoiding loss of vapors, add 50 cc. H_2O, heat 30 min. on a boiling water bath to decompose the excess of Ac_2O, cool, transfer to a separatory funnel with 3 × 50 cc. of 10% NaCl, dry the oil obtained with anhyd.

Na_2SO_4 overnight, and det. the sapon. no. of the acetylated oil. Ac_2O weaker than 95% or acetylation for less than 2 hrs. gives low results. Discussion of the results obtained during the last 3-4 yrs. showed that adulteration of oil of citronella is very exceptional, but that its quality seems to be falling off. Analysis of 39 samples gave: av. geraniol 88.3%, av. citronellal 42.4%, min. citronellal 23.2% (with 80.8% total geraniol), max. citronellal 69.6% (with 90.3% total geraniol). In order to improve the quality of the oil, more exacting requirements should be drawn up than merely total geraniol and soly. in alc. A. PAPINEAU-COUTURE

Control of oil of citronella. ETABLISSEMENTS A. CHIRIS. *Parfums de France* **4,** 261–8(1926); cf. *C. A.* **19,** 3349. (In French and English.)—It is recommended that a distn. test should be included in the specifications, particularly when the oil is required for the manuf. of citronellal and geraniol; and it is recommended that the residue on distg at atm. pressure to 250° should not exceed 10%. The reasons for and advatages of such a test are discussed. A. PAPINEAU-COUTURE

Some new constituents of Java oil of citronella. L. S. GLICHITCH. *Parfums de France* **4,** 253–60(1926). (In French and English.)—An investigation which is described in detail showed that all Java oils of citronella contain 5–10% (and even more in low-grade oils) of sesquiterpene fractions, b_{10} above 135°. These fractions contain small quantities of eugenol, geranyl butyrate and citronellyl citronellate, but consist for the most part of approx. equal parts of 2 isomeric tertiary alcs., $C_{15}H_{26}O$, one of which is monocyclic, solid, m. 46° (the true m. p. is probably 52.5°, which was obtained with the alc. regenerated from its phenylurethan), identical with *elemol* obtained from oil of elemi, and gives *a phenylurethan* (new) m. 112.5°; and the 2nd alc. is liquid, bicyclic, *l*-rotatory and gives a bicyclic sesquiterpene which yields cadinene hydrochloride and hydrobromide. A. PAPINEAU-COUTURE

Note on Java oil of citronella. E. J. PARRY. *Parfumerie moderne* **19,** 199–200 (1926). (In French and English.)—Java oil of citronella is generally worked up for both citronellal and geraniol, but sometimes only for geraniol. In the latter case the residue, with high citronellal content, is added to pure oil and sold as pure. P. considers it probable that some oils which contained practically 50% citronellal were adulterated in this way, while others which contained only 30–31% citronellal may have been adulterated with residues from which citronellal and possibly some geraniol had been removed. A. PAPINEAU-COUTURE

Synthetic vanillin. A. P. SACHS. *Perfumers' J.* **7,** No. 8, 12–3, 29–32(Aug., 1926).—Description of foreign and domestic processes for mfg. vanillin from oil of cloves. A. PAPINEAU-COUTURE

Aurines. Ear balsam. ANON. *J. Am. Med. Assoc.* **87,** 867–8(1926).—They contain glycerol 66, H_3BO_3 0.8 and a base, probably butyn, 0.1%. L. E. W.

The p_H and potency of digitalis infusions. M. L. TAINTER. *J. Am. Pharm. Assoc.* **15,** 255–9(1926).—Infusions of digitalis tend to undergo a spontaneous increase in acidity on standing, whether made with distd. H_2O or tap H_2O, or by methods of the U. S. P. IX or X, and also independently of temp. changes and preservatives. The presence of growing organisms may modify the direction or extent of the p_H changes. The loss of potency, as indicated by the official one-hr.-frog method, is not prevented or altered by the addn., to satn., of such preservatives as EtOH 10% (U. S. P. X), and $CHCl_3$, thymol, oil of cloves or oil of cinnamon. Deterioration is as rapid in sterile as in contaminated infusions, and seems to be due to the hydrolytic cleavage of the glucosides. The physiol. activity of fresh, standing and decompd. infusions is independent of their p_H. The true acidity of tinctures of digitalis is rather high, being nearly equiv. to that of a 0.0001 *N* HCl. L. E. WARREN

A chemical study of the rhizome and roots of Podophyllum peltatum L. H. L. KUESTER. *J. Am. Pharm. Assoc.* **15,** 259–63(1926).—Rhizomes (*a*) and roots (*b*) of *Podophyllum* were collected between 10–1–'24 and 11–12–'24, partly from cultivated and partly from wild plants. Each was dried and analyzed separately. Loss at 65° (*a*) 63, (*b*) 52%. Resin (*a*) 3.89, (*b*) 5.16. The yield of resin by the U. S. P. process was 3.15% from *a*. Ash from resin (*a*) 5.67%, (*b*) 3.98%. Sucrose was present in appreciable amts. in the exts. from the drug. Another lot of drugs collected 4–17–'25 gave H_2O (*a*) 64.5 and (*b*) 65%. A lot collected 5–2–'25 gave for H_2O (*a*) 74 and (*b*) 74.0%. A 3rd lot collected 5–19–'25 gave (*a*) 73.4 and (*b*) 73.2% loss on drying. L. E. WARREN

BENTLEY, ARTHUR OWEN AND HOLDEN, HENRY SMITH: **A Textbook of Pharmacy.** London: Baillière, Tindall and Cox. 540 pp. 15 s. Reviewed in *Pharm. J.* **117,** 291(1926).

Alkamine esters of *p*-aminobenzoic acid (local anesthetics). FARBWERKE VORM MEISTER, LUCIUS & BRÜNING. Brit. 241,767, Jan. 15, 1925. Methods are specified for the prepn. of: $RNHC_6H_4CO_2R'$, in which R and R', resp., are (1) Pr, $Et_2NCH_2CH_2$, (2) $MeOCH_2CH_2$, $Et_2NCH_2CH_2$, (3) allyl, $Et_2NCH_2CH_2$, (4) Pr, $Et_2N(CH_2)_3$, (5) $Me_2CHCH_2CH_2$, $Et_2NCH_2CH_2$, (6) Pr, piperidinoethyl, (7) $MeOCH_2CH_2$, piperidinoethyl. Hydrochlorides of these compds. are also described. Compds. of this type are obtained from *p*-aminobenzoic acid by substituting, in any desired order, an alkamine residue for the H atom of the COOH group and an alkyl or alkyloxyalkyl residue for a H atom of the NH_2 group.

Effervescent salt mixture. H. B. PALMER. U. S 1,598,103, Aug. 31. A perforated container which may be formed of paper contains $NaHCO_3$, $NaHSO_4$ and Ra-Ba chloride and is surrounded by a moisture-excluding wrapper. A unit thus prepd. may be used for prepg. medicinal baths.

Medicinal composition. J. W. STEVENS. U. S. 1,597,838, Aug. 31. Metallic Hg is used with dried corn cobs as a combustible material for burning with a slow glowing action as a producer of Hg vapor for inhalation.

Medicinal food. C. M. HICKEY. U. S. 1,598,348, Aug. 31. Raisins or other dried fruits are coated with medicinal substances, *e g.*, mucilage of acacia, phenolphthalein, citric acid, ext. of senna and aromatic ext of cascara sagrada.

Double compounds of theobromine or theophylline with calcium or strontium salicylate. KNOLL & CO. Brit. 241,266, July 14, 1924. Therapeutic compds. are prepd. by combining theobromine or theophylline or their Ca or Sr salts with an equiv. mol. quantity of basic or neutral Ca or Sr salicylate, or by reaction of $CaCl_2$ or $SrCl_2$ on alkali solns of theobromine or theophylline.

Dentifrice. F. W. NITARDY. U. S. 1,591,727, July 6. A dentifrice is prepd. with a base of purified paper pulp in which the original cell structure of the material (*e. g.*, cotton or wood) is preserved, substantially free from mineral and coloring substances, resins, volatile oils and other impurities.

Biochemical emulsion. J. R. CONOVER Can. 261,357, June 1, 1926. A colloidal K Ag salt of the peptones, polypeptides and other alk. degradation products of casein is prepd. by breaking down casein in an alk. soln and mixing the resulting soln. with $AgNO_3$ dissolved in water.

Local anesthesia in teeth. W. D. McFADDEN. U. S. 1,599,023, Sept. 7. The cleansed cavity of a tooth is treated with a local anesthetic such as cocaine and adrenaline which is sealed in with a moisture-excluding dental cement and allowed thus to remain for 2–4 hrs. The compn may be colored a different color from that of the teeth.

Disinfectants. A. WOLFF. Brit. 241,430, Jan. 22, 1925. A 1–10% soln. of $MgCl_2$, $CaCl_2$ or NaCl is repeatedly treated with ozone during the course of several days and the reaction may be promoted by the presence of oxides of Fe, Cu or Ni.

Sulfur-containing shampoo composition. W. H. KOBBE. U. S. 1,600,340, Sept. 21. A true soln. of S in oil (*e. g.*, olive oil) is used which when applied to the scalp in the presence of H_2O forms pptd. colloidal S.

Apparatus for supplying chlorine gas in small quantities as a medicinal agent. H. L. GILCHRIST. U. S. 1,599,883, Sept. 14.

18—ACIDS, ALKALIES, SALTS AND SUNDRIES

FRED C. ZEISBERG

The cement, acid and fertilizer plants of the Sulphide Corporation, Ltd., at Cockle Creek, N. S. W. ANON. *Chem. Eng. & Mining Rev.* **18,** 427–32(1926). E. J. C.

Effect of time and temperature of burning on the properties of lime. R. T. HASLAM AND E. C. HERMANN. *Ind. Eng. Chem.* **18,** 960–3(1926).—The study of a limestone considered incapable of producing plastic hydrate and of one giving a plastic hydrate indicates the existence of an optimum temp. and time of burning for the production of the most plastic lime from either kind of stone. The rate of interaction of lime hydrates with acid, the rate of settling, and the vol. of putty all vary with the plasticity. The fineness of the hydrate particles has a direct bearing upon the production of a plastic hydrate. Several curves and a section of the elec. furnace are shown. W. H. B.

The influence of added substances on the kind of nitrogen compound formed from barium carbonate-carbon mixes. PAUL ASKENASY. *Z. Elektrochem.* **32,** 216–7(1926).—The effect of about 5% of catalyst on the relative yields of cyanamide and cyanide in the process of fixing nitrogen with $BaCO_3$ depends on the temp. and on the catalyst.

Fe and Ni favor cyanamide (up to 40%). V, BaF_2, Cr and Ti favor cyanide (up to 100%). F. R. B.

Remarks on a contribution of Heinrich Franck and Fritz Hochwald on the changes of heat content in synthesis of calcium cyanamide. VICTOR EHRLICH. *Z. Elektrochem.* **32,** 187–8(1926).—E. assumes that part of the discrepancy in the heats of reaction of $CaCN_2$ is due to the true reactions being $CaC_2 \longrightarrow CaC + C; CaC + N_2 \longrightarrow CaCN_2$. F. R. B.

Manufacture of pure sodium chloride from marine waters without purification processes and without consumption of fuel. ENRICO NICCOLI AND MARIO MARITANO. *Giorn. chim. ind. applicata* **7,** 254–5(1925).—Equal. vols. of satd. brines and mother liquors at 38° Bé. composed of very concd. solns. of $MgCl_2$ (400–420 g. per l.) are mixed. A fine, powdery ppt. forms, amounting to about 200 kg. per cu. m. It is washed 2 or 3 times with satd. brine and shows a purity better than 99% on the dry wt. By using very simple plants there may be obtained a very pure salt in powder form, of const. compn. and at a lower price than rock salt of similar purity. ROBERT S. POSMONTIER

Process for extracting bromine from saline waters. ANNIBALE MORESCHI. *Giorn. chim. ind. applicata* **8,** 115–6(1926).—Considering the procedure applied to a brine of 25° Bé. (although it may be applied between 20° and 34° Bé.), the following facts are pertinent: (1) The Br set free by the action of Cl upon saline of 25° Bé. may be extd. continuously by the action of a solvent, particularly CCl_4. (2) A recovery of above 60% of the Br may be obtained by agitating the solvent with the water contg. the Br in a free state, in an emulsifying app. (3) The soln. of Br in CCl_4 seps. from the liquid and from the emulsion with the liquid continuously, impelling the emulsions to pass through a capillary system. (4) The Br is recovered from the solvent almost quant. by stirring the Br soln. with properly hydrated CaO. The reaction is rapid and the yield continuous with suitable app.; a powdery substance forms analogous in compn. to chloride of lime. All the Br may be obtained from this powder by the action of dil. acid. R. S. P.

Oil wells near Sand Springs yield brine for new chemical plant. J. C. CHATFIELD. *Natl. Petroleum News* **18,** No. 31, 91–2(1926).—The salts dissolved in the salt water from wells near Sand Springs, Okla., are being removed by heating and crystg. out in spray pits by the method invented by O. W. Martin. As the water is brought in, it is treated to remove the Fe_2O_3, then the $MgCl_2$, NaCl, $CaCl_2$ and finally I by electrolysis. Other products will be removed as the process is developed. M. B. HART

A calculation of the contamination of [German] streams by potash waste waters. W. KERP AND E. MERRES. *Arb. Reichsgesundh* **57,** 522–30(1926).—The contamination of the streams of the Middle Weser District is recalcd. on the basis of present ore compns., and the increase in hardness and Cl content are compared with the corresponding values as given in the Middle Weser decision, part 2. The specific streams mentioned are the Fulda, Werra, Upper Aller, Leine, Lower Aller and Middle Weser. F C. Z.

New method of preparing lead arsenates. L. CAMBI AND G. BOZZA. *Giorn. chim. ind. applicata* **7,** 687–96(1925); cf. *C. A.* **19,** 2391.—In the pptn. of $Pb(NO_3)_2$ by Na_2HAsO_4 there is formed a salt contg. about 1.25 times as much As_2O_5 as $PbHAsO_4$. In the pptn. of $Pb(NO_3)_2$ by Na_3AsO_4 there is formed a slightly basic trimetallic arsenate. In the pptn. of $PbCl_2$ by Na_3AsO_4 there is formed a basic trimetallic arsenate contg. chloroarsenate of Pb. The salt $Ca_3(AsO_4)_2$ is at least 250 times more sol. in the solns. used in this study than is $Pb_3(AsO_4)_2$. A practically complete double exchange takes place in the action of Pb nitrate or chloride upon $Ca_3(AsO_4)_2$. The pptn. of Pb arsenates in presence of Ca salts, either from mixts. of sol. Ca and Pb salts, or by the action of $Ca(OH)_2$ upon a mixt. of H_3AsO_4 and $Pb(NO_3)_2$ or $PbCl_2$ solns., gives ppts. having a slight, practically negligible content of CaO. The ppts. obtained in presence of chlorides are composed principally of Pb arsenate, with a partial formation of chloroarsenate. Because of this it is possible to employ solns. of H_3AsO_4 contg. HCl (such as are produced by the action of Cl upon As_2O_3) for the prepn. of Pb arsenates, without the previous sepn. of the HCl. The physical nature of the Pb arsenates produced by the authors' method of prepn., as regards state of subdivision and softness, is quite analogous to that of Pb arsenates obtained in other ways and used as insecticides. R. S. P.

Fluorspar and cryolite in 1925. H. W. DAVIS. *Bur. Mines, Mineral Resources of U. S., 1925,* Pt. II, 7–24 (Preprint No. 2, publ. July 28, 1926). E. J. C.

Some advances in gypsum technology. J. M. PORTER. *Chem. Met. Eng.* **33,** 549–50(1926); cf. *C. A.* **20,** 1896. E. J. C.

Anti-freeze solutions and compounds. H. K. CUMMINGS. *J. Soc. Autom. Eng.* **19,** 93–9(1926).—The effectiveness, advantages and disadvantages of various anti-freeze substances and compds. offered for use in automobile radiators are discussed. The app.

used at the Bur. of Standards for making f. p. and corrosion tests are described.
M. B. Hart

Carbolite—a condensation product of phenols with aldehydes. G. S. Petrov. *Kunststoffe* **16**, 81-3, 107-9, 124-5(1926).—See *C. A.* **20**, 2394. D. Thuesen

Experiments on the preparation of phenol-formaldehyde condensation products. II. The manufacture of bakelite and its properties. Shunzo Sugimoto. *Repts. Imp. Ind. Research Inst. Osaka* (Japan) **7**, No. 1, 1-32(1926).—Various factors in the manuf. of bakelite were studied. The influence of variation in NH_4OH as a condensing agent on the speed of reaction, yield, strength, insulating property and color of the product was given special attention. To obtain a clear amber-colored product NH_4OH is recommended, while for a cream or pink opaque product, condensation by NaOH with subsequent neutralization is recommended. The color and the yield increase with the amt. of condensing agent used. The best proportion for PhOH and HCOH is in the ratio of their mol. wts. Bakelite with electrifiable property can be obtained by means of NaOH or HCl used as condensing agents, but when NH_4OH is used a special substance must be added. A new property of bakelite in absorbing ultra-violet rays was discovered. Nao Uyei

The condensation product of formaldehyde and urea. H. Kadowaki and Y Hashimoto. *Repts. Imp. Ind. Research Inst. Osaka* (Japan) **7**, No 6, 1-28(1926).—The optimum temp. for condensation is about 85° and the best method of mixing the raw materials is to add the aq. $CO(NH_2)_2$ soln. gradually to the HCHO soln. One way of preventing the formation of bubbles is to dry the product first at 60° and then at about 100°. The phys. and chem. properties of the product are described. Unlike glass it does not absorb ultra-violet rays. The use of condensing agents which include weak inorg. acids, inorg. and org. bases, the salts of alk. and alk. earth metals with org. acids, simplifies the operation. For practical purposes the product has the defect of developing cracks after standing, is impossible to cast on account of shrinkage, and the product has limitations in thickness. The latter 2 defects can be remedied by heating the powd. cryst. condensation product in a mold at about 120° and 60 atm.
Nao Uyei

Waeser, Bruno The Atmospheric Nitrogen Industry with Special Consideration of the Production of Ammonia and Nitric Acid. Vols. I and II. Translated by E. Fyleman. London · J. & A. Churchill. 1-330 pp. and 331-746 pp. £2 2s for the 2 volumes

Hydrocyanic acid. G. Bredig and E. Elod. U. S. 1,598,707, Sept. 7. NH_3 and CO are allowed to react at temps. of about 600° in the presence of Si carbide or other carbides of elements of group IV of the periodic system Cf. *C. A.* **19**, 3149.

Phosphoric acid. H E LaBour. U. S. 1,597,984, Aug. 31. In order to carry off F from H_3PO_4, vapors are evolved and blown away below the b. p.

Phosphoric acid. Chemische Fabrik Griesheim-Elektron. Brit. 241,903, Oct. 23, 1924. The condensation of P_2O_5 produced by burning P or P-contg. gases is effected by the use of hot H_2O or hot H_3PO_4 soln., *e. g.*, in a packed tower.

Phosphoric acid. M. Larsson Can. 259,208, Mar. 23, 1926. H_3PO_4 and H_2 are produced by reacting upon a phosphide of a metal reducible by H_2 by means of H_2O to oxidize the P of the phosphide into P_2O_5 and to set free the H_2 of the H_2O.

Concentrating nitrous gases. H. Johnsen. U. S. 1,600,547, Sept. 21. Gases from fixation of atm N or similar gases are absorbed in a soln. of alkali metal phosphate and the resulting mixt. is heated in a closed chamber to a temp. (which may be about 600°) at which the N is sepd. in the form of nitrous gases, with regeneration of the alkali metal phosphate.

Ammonia synthesis. Synthetic Ammonia & Nitrates, Ltd., and F. H. Bramwell. Brit. 241,817, May 4, 1925. A catalytic chamber is surrounded by a heat-exchanger comprising concentric tubes, for heat-exchange between hot gases from the chamber and cold incoming gases.

Ammonia synthesis. H. Harter. Brit. 241,771, Jan. 21, 1925. See U. S. 1,570,485 (*C. A.* **20**, 802).

Cyanides. K. F. Cooper. U. S. 1,599,212, Sept. 7. A crude cyanide contg. other products, *e. g.*, NaOH or Na_2CO_3 or both, is fused with an added ferrocyanide such as $Na_4FeC_6N_6$ and any Fe that seps. out during the fusion is removed and the Fe-free product is cooled and recovered.

Alkali cyanides. L. D. Mills and T. B. Crowe. Brit. 241,669, Sept. 3, 1924. A soln. contg. CN compds. is acidified, *e. g.*, with SO_2, and passed in a finely divided state

counter-current to a large vol. of air which removes the HCN from the soln. and the HCN is brought into contact with an alkali soln.

Alkali aluminates. RHENANIA VEREIN CHEMISCHER FABRIKEN AKT.-GES. Brit. 241,232, Oct. 13, 1924. Na_2SO_4 or K_2SO_4 is heated to about 1100° with an aluminous material such as bauxite, hydrargillite, diaspore or clay, in a current of inert gas such as furnace gas or air in the presence of steam. About equimol. proportions of sulfate and Al_2O_3 are used and if SiO_2 is present lime or $CaCO_3$ is used in the proportion of 2 mols. to 1 mol. of SiO_2 to produce an insol. silicate.

Aluminum chloride. G. W. GRAY and F. W. HALL. Can, 259,219, Mar. 23, 1926. A mixt. of aluminous material and C which contains an excess of C is prepd.; the mixt. is heated so that some of the C is consumed and a coked mixt. contg. an excess of alumina is produced; the coked mixt is then treated with a chlorinating agent under conditions to form $AlCl_3$. Cf. *C. A.* **19**, 155.

Aluminum chloride. G. W. GRAY. Can. 259,218, Mar. 23, 1926. Hot gases are generated and applied at a high temp to a retort contg alumina-C materials, the gases are withdrawn and applied at a lower temp. to a Cl_2-generating app., into which material is placed to react to form Cl_2; the Cl_2 is conducted to the retort.

Aluminum chloride. E. C. MARBURG. Can. 262,622, July 13, 1926. Alumina is produced from the Al_2Cl_6 obtained by extg. potter's earth or clay with HCl and evapg. the soln. to crystn. This process comprises dilg the mother liquors resulting from the sepn. and washing of the magma of Al_2Cl_6 crystals, treating the liquors with calcined potter's earth, and subjecting the resulting soln to evapn.

Aluminum chloride. R. J. DEARBORN. U. S 1,600,216, Sept. 21 A mixt. of bauxite or other Al ore and carbonaceous material is simultaneously coked and purified by heating and chlorinating at a relatively low temp. and then without loss of heat the purified coked mixt. is chlorinated at a relatively high temp An app is described.

Aluminum halides and alkaline earth metal carbides. J. R. MARDICK. U. S. 1,600,899, Sept. 21. An aluminous material such as bauxite is heated with $CaCl_2$ or other alk. earth metal halide and C to produce an Al halide, which is volatilized from the charge, and also to form an alk. earth metal carbide which is recovered.

Alumina. H SPECKETER. Can. 259,806, Apr 13, 1926. Alumina almost free from Fe is produced by extg. potter's earth or similar aluminous material with mineral acid, reducing the ferric salt to ferrous salt, evapg. the ferroginous Al salt soln., decompg. the residue by heat and sepg the alumina from the sol ferrous salt; the decompn. by heat is carried out in direct contact with hot reducing gases.

Sodium sulfate. J. W. HILL. Can. 261,891, June 22, 1926. Anhyd. Na_2SO_4 is obtained commercially from hydrated Na_2SO_4 satd at approx 32 4°. The soln. is then heated to cause pptn. of anhyd. Na_2SO_4 through the natural decrease of soly. of this salt between the temps. named.

Acid sulfite. J. B. BEVERIDGE. Can. 259,884, Apr. 20, 1926. A soln. of Ca-Mg acid sulfite is treated with a sufficient quantity of $NaHSO_4$ to furnish the necessary SO_4 ions to ppt. all of the Ca ions of the Ca-Mg acid sulfite, thereby forming $NaHSO_3$ and $MgH(SO_3)_2$ in soln. and a ppt. of $CaSO_4$.

Sodium chloride from natural brine. C. S. ROBISON U. S. 1,598,935, Sept. 7. A natural brine is evapd. to ppt. heavier NaCl crystals and the lighter suspended foreign solids are removed from the liquor after they have been pptd. and before they have been aggregated and accumulated to the point of supersatn of the liquor

Decomposing silicates, etc. H. MEHNER. Can. 262,339, July 6, 1926. Na or K silicate is heated with C, the CO formed is burned and Na and K compds. are recovered. Al silicate heated with C and Fe forms Fe-Si, CO and Al. The Al burned, together with the CO, forms Al_2O_3. H_3PO_4 is formed from phosphates by a similar process.

Metallic phosphides. W. KOEHLER. U. S. 1,599,618, Sept. 14. A finely comminuted metal, *e. g.*, Cu, is mixed with P in finely divided condition and the mixt. is subjected to pressure and may be heated to 260°.

Removing dust from calcium cyanamide. J. BRESLAUER. Can. 262,625, July 13, 1926. Dust is removed from $CaCN_2$ and the latter deodorized by treating simultaneously with a current of CO_2 and overheated steam.

Decomposing calcium fluoride. A. G. BETTS. U. S. 1,598,672, Sept. 7. CaF_2 is decomposed with ferric and Al sulfates or other suitable salt of a multivalent reducible metal so that a multivalent fluoride salt of the metal is formed in soln. and this is reduced to a lower valency, *e. g.*, by Fe or electrolysis, and a F compd. such as a fluoaluminate is recovered from the soln.

Complex fluorine salts, etc. A. F. MEYERHOFER. Brit. 241,588, Dec. 20, 1923.

The process of Brit. 226,491 (*C. A.* **19**, 2113) is modified by using other complex hydrofluoric acids or substances which yield them instead of hydrofluosilicic acid or hydrofluoboric acid.

Hypochlorites. RADUNER & CO., AKT.-GES. Brit. 241,851, Oct. 21, 1924. Al is used for parts of app. which come into contact with $Ca(OCl)_2$ or other hypochlorites in various processes.

Siliceous alkaline earth product. R. CALVERT. Can. 262,985, July 27, 1926. A compn. of matter for use in filtration is made by heating a mixt. of finely divided diatomaceous earth, a hydroxide of an alk. earth metal and water.

Iron carbonyl composition. M. MÜLLER-CUNRADI and A. KOSSUTH. Can. 262,600. July 13, 1926. The compn. consists of a soln. of Fe carbonyl in hydrocarbons and a stabilizer.

Iron carbonyl composition. A. MITTASCH and M. MÜLLER-CUNRADI. Can. 262,601. July 13, 1926. The compn. comprises Fe carbonyl solns. contg. at least 20% by vol. of Fe carbonyl in a hydrocarbon or mixts. of hydrocarbons.

Phosphorus pentoxide. G. PISTOR. Can. 262,632, July 13, 1926. The heat produced by burning P of gas mixts. contg. the same is utilized by previously drying the combustion air, burning the P, and transmitting the combustion heat to a heat-absorbing app.

Active carbon. J. N. A. SAUER. Can. 257,964, Feb. 9, 1926. Spent active C is re-activated and activated C is produced from raw or carbonized carbonaceous material by the aid of heat and activating gas or vapor; the material is maintained in a state of agitation and flotation by a blast of gas and the product drawn off by the discharged reaction gases. Cf. *C. A.* **20**, 2232.

Carbon black. S. A. WISDOM. Can. 260,226, Apr. 27, 1926. A stream of C_2H_2 is heated with an oxidizing gas sufficient for complete combustion of only a small percentage of the C_2H_2, to a temp. at which dissocn. of the C_2H_2 occurs.

Revivifying activated carbon. V. S. ALLIEN. U. S. 1,599,072, Sept. 7. C to be revivified is supported in thin layers upon a series of superposed substantially flat interiorly heated shelves along which the material is advanced, the temp. of the shelves increasing progressively.

Dissociating carbonaceous gases, etc. S. A. WISDOM. Can. 260,227, Apr. 27, 1926. C black is made by dissociating a stream of mixed carbonaceous gases, one of which is endothermic, and conserving the dissocn. heat of the endothermic gas to effect dissocn. of a part at least of the other components of the mixt.

Packaging solid carbon dioxide. G. B. BLANCHARD. U. S. 1,600,308, Sept. 21. Solid CO_2 is enclosed in absorbent material such as muslin impregnated with frozen H_2O.

Recovering cyanides from gases. L. W. HEFFNER and W. TIDDY. U. S. 1,600,228, Sept 21. Distn. products from ammoniacal liquors or other gases contg. NH_3 and cyanides are treated with an absorbing medium such as a NaOH soln. to absorb the cyanides and the latter are converted into Prussian blue.

Sulfur. J. JANNEK. U. S. 1,599,363, Sept. 7. Masses contg. S, *e. g.*, activated C carrying S, are treated with superheated steam which is passed in contact with the material at high speed and S is sepd. from the steam.

Bromine. R. E. WILSON. U. S. 1,599,108, Sept. 7. Brine contg. small quantities of Br, such as sea water, is treated, *e. g.*, with Cl, to liberate Br, and passed over Ag surfaces to form AgBr which is dissolved in KBr soln. and electrolyzed to obtain Br.

Chlorine. D. A. PRITCHARD and J. H. HUBEL. Can. 259,804, Apr. 13, 1926. The constituents of gaseous mixts. contg. Cl_2 are sepd. by reducing the temp. of these gases to form Cl hydrate and raising the temp. of the Cl hydrate to yield pure Cl_2.

Iodine. W. L. CHANDLER. Can. 260,359, May 4, 1926. Cryst. I is formed in the rapid and vigorous oxidation of fairly strong solns. of HI by the action of a concd. soln. of hypohalous acid. Cf. *C. A.* **19**, 1932.

Container for liquid oxygen. C. MOTT. U. S. 1,598,149, Aug. 31.

Metallic catalyst. E. J. LUSH. Can. 260,282, Apr. 27, 1926. Turnings of metal, *e. g.*, Fe, are subjected to an electrolytical anodic oxidation; a salt of an alkali metal (K_2CO_3) is used as the electrolyte; they are afterwards reduced in H_2.

Protein substances from soy beans. O. JOHNSON. Brit. 241,249, June 10, 1924. Soy beans, cake or meal are ground with an aq. alk. soln., solid matter and free oil are sepd. and albuminous substances are extd. from the remaining juice, *e. g.*, the juice may be curdled with H_2SO_4, HCl, HOAc or alum, the curd sepd., washed and bleached by repeated soln. in alkali and pptn. and finally dried *in vacuo*. The product may be

used in paint, calcimine, sizing for paper or cloth, in barrel linings, adhesives or for making artificial ivory, horn, bone, etc.

Revivifying spent filtering materials. S. Hiller. U. S. 1,598,967, Sept. 7. Kieselguhr used for treating oils or sugar solns. or similar material is subjected in successive portions to ignition and combustion of carbonaceous substances present in the material. An app. is described.

Adsorptive agent for purifying oils or other liquids. P. W. Prutzman and A. D. Bennison. U. S. 1,598,256, Aug. 31. Mg silicate is treated with H_2SO_4 and reduced to a finely divided condition. U. S. 1,598,254 specifies natural Mg silicate having adsorptive properties, in finely divided condition. U. S. 1,598,255 specifies the treatment of the Mg silicate with HCl.

Moisture-proof composition for clarifying transparent surfaces. A M. Bowman. U. S. 1,600,575, Sept 21. A compn. for use on wind shields or similar surfaces is formed of lanolin 2 and a thinner such as cresol 1 part.

Liquid coating composition. G. A. New. U. S. 1,598,688, Sept. 7. A compn. suitable for coating corset and collar steels comprises kauri gum 20, China wood oil 40, MnO_2 1, Fe oxide 4, turpentine 15, "Venolin" 10 and lampblack 10 parts.

Improving glauconite. A. C. Spencer. Can 258,615, Mar. 2, 1926. Glauconite is heated and afterwards treated with an alkali.

Composition for stiffening shoes. C. E. Swett. U. S. 1,599,598, Sept. 14. Acid resin is melted and there is added to it a base such as $Ca(OH)_2$ mixed with powd. acid resin to form a resin soap. Montan wax or other hard wax is then added to the mass, followed by addn. of China wood oil.

Indurated articles from phenolic condensation products. W. Achtmeyer. U. S. 1,599,627, Sept. 14. A sol. condensation product of a phenolic compd. and CH_2O, together with not more than about 11% its quantity of castor oil, is used in soln. for treating clutch or brake-lining fabric or other fibrous material and the material is hardened.

Waterproof paste. S. McMurray. Can. 261,267, June 1, 1926. A paste for admixt. with cement and other materials for strengthening and waterproofing the same comprises latex, hexamine, silicate of soda, gum arabic, potash soap and water.

Plasticizing method. F. P. Brock. Can. 261,953, June 22, 1926. A plasticized molding mixt. is prepd. by converting a paper-phenol resin product to powder, and incorporating furfuraldehyde therewith.

Treating meerschaum pipes. J. Beckwith. U S. 1,600,501, Sept. 21. To color meerschaum pipes and render them more durable, they are subjected to the smoke and volatile products arising in the production of charcoal for a relatively long time (which may be about 8 hrs.) and then for a relatively short time are subjected to a higher temp to drive off volatile substances from the meerschaum and deposit fine particles of C in its interstices.

Plastic compositions for molding. Koln-Rottweil Akt.-Ges. Brit. 241,528, Oct. 17, 1924 Oxidized oils, with or without resin, and nitrocellulose are mixed with gelatinizing, softening, filling and coloring media.

Satuating brake bands or other similar fibrous substances with oxidizing oils or like materials. W. R. Howard. U. S. 1,598,376, Aug. 31. Fibrous material is dried in a container and the evapd. moisture is drawn off. A satg. fluid to be subsequently oxidized is then added to the container, and subsequently, after removing excess satg. fluid, the impregnated material is subjected to the action of circulating heated air or other oxidizing agent.

Adhesive. O. Johnson. U. S. reissue 16,422, Sept. 14. See original pat. No. 1,460,757; *C. A.* **17,** 2941.

Detergent. H. E. Fritz. U. S. 1,599,996, Sept. 14. A cleaning powder adapted for use on porcelain comprises $NaHSO_4$ or other alkali bisulfate mixed with a quantity of a metallic oxide such as MgO which is sufficient to react with only a portion of the bisulfate.

Detergent. J. L. Teach. U. S. 1,598,664, Sept. 7. A compn. suitable for cleaning the hands is formed of kerosene 100, oleic acid 13, H_2O 50 and 26% aq. NH_3 soln. 3.5 parts.

Anti-freezing solution. P. Wagner. U. S. 1,598,464, Aug. 31. NaCl and catechu (6 oz. each per gal.) are used in H_2O as a soln. for automobile radiators, etc.

Dental casting material. R. M. Withycombe. U. S. 1,598,668, Sept. 7. Cu oxide 1 and S 1–6 parts are formed into a homogeneous mass by heating, for use in casting dental models or matrices.

Cork board. L. L. Bentley. U. S. 1,598,039, Aug. 31. Cork particles are

mixed with a substance such as CaC_2 which is capable of generating heat *in situ* when acted on by the moisture present in the cork and causing a partial distn. of the latter.

Floor covering composition. W. H. W. Idris. U. S. 1,600,045, Sept. 14. A concrete base is covered with a mixt. formed from ground pumice or other porous material mixed with a drying oil and coloring material. Cf. *C. A.* **19,** 1036.

Articles of dolomitic composition. H. S. Lukens. U. S. 1,597,811, Aug. 31. In the manuf. of molded articles, MgO is carbonated to convert it into a binder in the presence of $CaCO_3$ which accelerates the reaction.

Foam for fire prevention. L. Burgess. U. S. 1,599,006, Sept. 7. An aged mineral oil sulfonic compd. in aq. soln. is used as the continuous phase of a foam which may also comprise reaction products of $Al_2(SO_4)_3$ and $NaHCO_3$.

Fire extinguishing composition. G. E. Ferguson and L. G. M. Timpson. Can. 262,213. June, 1926. A foam-producing charge contains a large proportion of $NaHCO_3$, a fraction of that amt. of residues from the sulfite cellulose process, and also a smaller fraction of that amt. of wood flour.

Stencil paper. H. Hartmann. U. S. 1,600,226, Sept. 21. A permeable paper body carries a coating formed mainly of protein material and a protective coating of collodion or other elastic substance impervious to atm. action and capable of preventing hardening of the protein coating.

19—GLASS, CLAY PRODUCTS, REFRACTORIES AND ENAMELED METALS

G. E. BARTON, C. H. KERR

Certain aspects of the surfaces of neutral glasses towards tests in the autoclave. Arnaldo Mauri. *Giorn. chim. ind. applicata* **7,** 452–65(1925).—Within the limits of normal temp. of boiling of H_2O, and sometimes within a max. of 120°, the general law holds with Zn glasses, as well as with glasses without Zn: the amt. of alkali given up is the greater the higher the content in alkali in the compn. of the glass considered. At temps. above boiling the behavior of glasses is such that the alkali given up by the glass becomes greater in Zn glasses, even if their content of alkali is less than that in non-Zn glasses. Zn glasses, but not non-Zn glasses, show devitrification in tests at high temps. (scalings and peelings). The cause of the lower chem. resistance of glasses at high temps. compared to the behavior of the same glasses at low temps. is related to devitrification, and hence to the presence of Zn in the glass. Simple analysis of neutral glasses and detn. of the degree of alky. do not give sufficient data for ascertaining their chem. resistance; it is necessary to exam. the glasses as to the degree of tendency towards scaling in function of temp. and time employed in the tests. Common chem. lab. glasses, not intended for temps. exceeding 100°, do not need to be subjected to autoclave tests since the presence of Zn in them confers upon them greater resistance to sudden changes of temp., a very desirable quality. Autoclave tests at high temp. are necessary for neutral glasses destined for pharmaceutical labs., and especially for making vials for hypodermic injections; glasses for the latter purpose should be tested at 150° as a guaranty that incipient devitrification will not take place at sterilization temp. Neutral glasses contg. Zn must, therefore, be excluded from such uses, independently of the fact that they may contain Pb. Powders of neutral glasses behave like the glasses themselves; hence tests upon the powders by means of alkali indicators are not conclusive, and may lead to fallacious interpretation upon glasses intended for sterilizations. R. S. P.

A dilatometric and thermal study of glasses from silica and soda. Michel-O. Samsoen. *Compt. rend.* **183,** 285–6(1926).—S. studies the coeff. of dilatation and temp. of transformation of various soda-silica glasses. He finds a maximum corresponding to $2SiO_2.Na_2O$ (I). In the system Na_2O-SiO_2 the only definite compds. are $Na_2O.SiO_2$ (II), and I. Glasses corresponding to the branch of the curve going from II to the min. II–I were very easily devitrifiable. D. H. Powers

Notes on viscosity and devitrification of glass in Fourcault operation. J. W. Cruikshank. *Bulletin. Am. Ceram. Soc.* **5,** 344–6(1926).—The glass must be high in alkali and low in CaO. Devitrification is caused chiefly in the drawing. C. H. K.

Rapid cooling of glass. G. Gehlhoff and M. Thomas. *Z. tech. Physik* **6,** 333–8 (1925). H. G.

The annealing of glass—a non-technical presentation. A. N. Finn. *J. Am. Ceram. Soc.* **9,** 493–500(1926). C. H. Kerr

Vitreous silica and vitreous quartz. W. W. Winship. *Trans. Am. Electrochem.*

Soc. **50** (preprint), 12 pp.(1926).—Indifference to corrosion of vitreous SiO_2 wares, even at high temp. except under basic conditions, renders them suitable for such operations as high-temp. reactions with phosgene, purification of gases, preheating ammonia-air mixts. in ammonia oxidation processes, handling high-strength H_2O_2 solns., and for conducting concn., absorption and cooling processes with acids. A recently designed HCl-absorption vessel of fused silica has shown high efficiency. Articles of fused silica grains bonded by gelatinous silica possess properties which promise usefulness in various fields, retaining the small coefficient of expansion which is characteristic of fused silica itself. An interesting application of fused quartz outside the chemical field is as the frangible bulb of automatic sprinkler heads for fire extinguishing, the bulb having to stand great extremes of temp. during the sealing process required to confine the bursting charge of volatile liquid. C. G. F.

Some properties of fused quartz and other forms of silicon dioxide. H. L. WATSON. *J. Am. Ceram. Soc.* **9**, 511–34(1926).—A compilation of data on phys properties. C. H. KERR

Ceramic products. Report of the Belgian national chemical committee. LECRENIER. *Compt. rend. 6e conférence intern chim. (Bucarest)* **1925**, 373–6.—Description of the methods used in Belgium for the detn. of H_2O, loss on ignition, SiO_2, Fe_2O_3 + Al_2O_3, CaO, MgO, alkalies, Fe_2O_3 and for carrying out the "rational" analysis (free SiO_2 feldspar). The latter is not used to any great extent in the examn of ceramic clays in Belgium. **Report of the Fédération Nationale des Associations de Chimie de France.** A. GRANGER. *Ibid* 377–8.—"Rational" analysis gives reliable results only when the sample consists exclusively of a mixt of kaolinite and quartz sand; in other cases it is of some value if the results are interpreted with due regard for other minerals present **Report of the National Research Council of Japan.** TOYOKICHI TAKAMATSU *Ibid* 378–84.—Detailed description of the technic generally used in Japan for the detn. of H_2O, loss on ignition, SiO_2, Fe_2O_3 + Al_2O_3, TiO_2, CaO, MgO, alkalies, quartz and feldspar. **Report of the Chemische Raad van Nederland and of the Nederlandsche Vereeniging van Aardewerk Fabrikanten.** H D. MAUSER *Ibid* 384 7—The methods used in Holland are those of Hillebrand, of Bollenbach, or method C18 21 of the Am. Soc for Testing Materials, with minor variations in technic The value of the detn of quartz and feldspar, which is not used to a great extent in Holland, would be increased by standardizing the technic. **Report of the Fédération Nationale de Chimie pure et Appliquée de Polognée.** J. ZAWADZKI. *Ibid* 387–9.—Outline of the standards and tests for portland cement and of the tests of ceramic clays, used in Poland **Report of the Société Chimique de Roumanie.** GEORGES CAPSA. *Ibid* 389–96.—"Rational" analysis of clays is of considerable value in the control of ceramic mixts. The error introduced by considering foreign minerals as feldspar and sand are of no importance in ordinary ceramic mixts. C. describes in detail the technic he has followed for 15 yrs. It differs from the usual procedure chiefly in that the solns are filtered instead of decanted after treatment with HCl and with NaOH, thereby greatly increasing accuracy and speed. C. shows that from the complete chem. analysis of the original clay and the complete chem. analysis of the insol. residue remaining after treatment with H_2SO_4 the nature and proportion of the various minerals present can be calcd. Taking as an example the Ledetz kaolin which Seger (Seger's gesammelte Schrifte, 1896 edit , p. 44) gives as consisting of kaolinite 86.27, feldspar 8 65, sand 5.08%, C. shows that it consists of: kaolinite 85.89, $MgCO_3$ 0.38, muscovite mica 5.04, orthoclase feldspar 3 51, shale 1.41, sand 4.16%. **Report of the Société Céramique Tchécoslovaque.** BARTA. *Ibid* 396–8.—The Society proposes using the Sedlice (near Karlovy Vary) kaolin as standard and has prepd. 100 kg. to be distributed as standard samples. O. Kallauner's and J. Matejka's method for the detn. of the mineral constituents is proposed as standard. The method is based on the detn. of $CaCO_3$ + $MgCO_3$ by treating with cold 1:1 HCl for 15 min., detn. of loss on heating 30 min. at 950–1000°, of loss on heating 1 hr. in an elec. furnace at 650–700°, treatment of the residue from the latter heating for 3 hrs. in the water bath with HCl (d 1.1), and detn. of Al_2O_3 and Fe_2O_3 in soln. and in the undissolved residue. If an appreciable amt. of mica is present, alkalies should be detd. both in the portion dissolved out by HCl and in the original sample. The method of calcn. is not clear from the article. A. PAPINEAU-COUTURE

Continuity in plastic bodies. H. SPURRIER. *J. Am. Ceram. Soc.* **9**, 535–40(1926).—Plasticity of a clay increased with the growth of algae in it and the presence of hydrogel of Al caused by a biochem. reaction. Air, included, caused shortness. Expts. were run in evacuating the air in a clay and then by suddenly breaking the vacuum, collapsing the evacuated clay. It showed greatly increased plasticity, reduced warpage, elimination of blistering and resistance to rupture on distortion. C. H. KERR

Hydrogen-ion measurements on clay slips. D. W. RANDOLPH AND A. L. DONNENWIRTH. *J. Am. Ceram. Soc.* **9**, 541-7(1926).—A simple app. is described. C. H. KERR

A new type of drier heater. C. F. GEIGER. *J. Am. Ceram. Soc.* **9**, 551–4(1926). C. H. KERR

Firing terra cotta in an open kiln. O. E. MATHIASEN. *J. Am. Ceram. Soc.* **9**, 548–50(1926). C. H. KERR

Methods of testing and the physical properties of wet-process electrical porcelain. L. NAVIAS *J. Am. Ceram. Soc.* **9**, 501–10(1926).—*Compressive strength.*—Height of the sample is an important variable. Ultimate, and not initial, failure should be detd. Specimen 1 sq. in in area (1[1]/[8]" diam.) and 1[1]/[8]" high is recommended. *Transverse strength* —Load causing rupture is directly proportional to the cube of the diam. of the cylinder. A cylinder with a 1 sq. in. area is suggested. *Tensile strength.*—The tensile strength decreases rapidly as the area of min. cross section increases. Test specimens with conically shaped ends and min. area of 1 sq. in. were used. C. H. KERR

Modern viewpoints in the selection of refractories. J. L. BIENFAIT. *De Ingenieur* **1926**, 210; *Arch. Suikerind.* **34**, 650–9(1926).—Chem. analysis is of little use because fire bricks of the same chem compn. may be very different in refractory properties. Phys methods of testing which are in use at present are discussed, with special reference to deformation by pressure at increasing temp. Expts. have been made with an app designed by Seger and Cramer (illustrated) for measuring, and registering on a chart the change in length of the brick section under const. pressure for each time interval. The gradually increasing temp. is detd. pyrometrically and can thus be plotted directly against the change in length. For chamotte bricks there is a large temp. interval between incipient softening and collapse, while silica bricks collapse all at once when a certain temp. is reached. This test is being used more and more as a basis for specifications. F. W. ZERBAN

Determination of the refractory power of clays from their water of constitution. N. P. CHIVEVSKII. *Rev. soc russe métal.* No. 1 (June, 1925); *Rev. métal.* **23** (Extraits), 302 3(1926) —A diagram shows the relation between H_2O of constitution and m p. of clays. When loss on ignition is detd. it must be corrected for hygroscopic H_2O, org. matter, and CO_2 driven off. A. PAPINEAU-COUTURE

The thermal expansion of some fused oxides used as refractories. G. E. MERRITT. *Trans Am Electrochem Soc.* **50** (preprint), 10 pp.(1926).—The thermal expansions up to 900° of the oxides of Si, Th and Zr, of a mixt. of one-to-one mol. proportions of ThO_2 and ZrO_2, and of the refractories made of MgO, Al_2O_3 and ZrO_2 were measured. The results are exhibited in graphical form and intercompared. From the "S" form of the curves and other evidence, it is concluded that a combination takes place when ThO_2 and ZrO_2 are fused in these proportions. C. G. F.

Notes on agalmatolith, a new refractory material. O. K. BURGER. *Bulletin Am. Ceram. Soc* **5**, 343(1926).—Chem. analysis is SiO_2 63.01, Al_2O_3 30.25, Fe_2O_3 0.65, MgO 0 15, ignition loss 6 12%. It is apparently a dense variety of pyrophyllite, Al_2O_3.-$4SiO_2.H_2O$. The stone is easily worked and when burned to 1100° is harder than steel. Fusing point is about cone 30 Thermal cond. is 10–20% higher and coeff. of thermal expansion 30% lower than those of porcelain. It is a promising refractory material, found in Brazil.

Service conditions of refractories for open-hearth steel furnaces (LARSEN, *et al.*) **9**. A study of the vitreous state through enforced crystallization (PONOMAREV) **2**. An application of recrystallized SiC (FITZGERALD) **4**. Thermal insulation of electric furnaces (a new fireclay refractory) (HARTMANN, WESTMONT) **4**.

MILLENET, L. E.: **Enameling on Metal—A Practical Manual on Enameling and Painting on Enamel as Applied Particularly to Gold and Silver Ware and Art Metal Work.** Translated by H. de Koningh from French. London: Crosby Lockwood & Son. New York: D. Van Nostrand Co. 112 pp. $2.00. Reviewed in *Ind. Eng. Chem* **18**, 987(1926).

Sheet glass manufacture. J. H. FOX and H. F. HITNER. U. S. 1,598,764–5, Sept. 7. Mech. features.

Light-diffusing hollow glassware. F. SKAUPY and G. GAIDIES. U. S. 1,600,072, Sept. 14. After glassware is shaped from clear glass, there is applied to it a layer of clouded enamel and over this there is superposed a layer of different enamel having a smooth surface when fused.

Fining glass. R. D. PIKE. U. S. 1,598,308, Aug. 31. Melted glass is passed through a vacuum chamber to which heat is applied to maintain the temp. of the glass.

Glass tank furnace. C. D. MCARTHUR. U. S. 1,598,779, Sept. 7.

Apparatus for making sheet glass. W. G. KOUPAL and J. S. GREGORIUS. U. S. 1,598,729, Sept. 7. U. S. 1,598,730 (W. G. KOUPAL) specifies an app. also for the same purpose.

Apparatus for forming sheet glass. L. MONDRON. U. S. 1,598,740, Sept. 7.

Apparatus for making sheet glass. H. F. CLARK. U. S. 1,599,647, Sept. 14.

Apparatus for drawing sheet glass. H. G. SLINGLUFF. U. S. 1,598,751, Sept. 7.

Apparatus for making sheet glass. F. GELSTHARP. U. S. 1,598,770, Sept. 7.

Tank furnace for melting glass. J. E. SWEET. U S. 1,598,780, Sept. 7.

Apparatus for melting and fining glass. R. D. PIKE. U. S. 1,598,307, Aug. 31.

Annealing and cooling sheet glass. W. L. MUNRO. U. S. 1,597,994, Aug. 31. Counter-current streams of heated air or other gas are passed through a leer tunnel on both sides of the glass.

Furnace for heating glass-drawing pots. F. A. OST. U. S. 1,598,782, Sept. 7.

Furnace for melting glass. M. J. OWENS. U. S. 1,600,484, Sept. 21.

Ceramic mixture. H. SPURRIER. Can. 260,494, May 4, 1926. Ceramic mixts. are treated by evacuating the gases from the mass, and suddenly breaking the vacuum.

Apparatus for treating ceramic mixtures in vacuo. H. SPURRIER. U. S 1,600,493, Sept. 21.

Molding and drying pottery ware. E. S. LEA. U. S. 1,600,286, Sept. 21. Mech. features.

Clay bricks, tile, etc. NAAMLOOZE VENNOOTSCHAP DE VLAMOVENSTRAATKLINKER. Brit. 241,518, Oct. 7, 1924. Clay before molding is heated until the air has been largely expelled by the vapor from the H_2O present. It is stated that material for cement bricks may be similarly treated.

"Anti-slipping" or safety tile. M. C. BOOZE. U. S. 1,600,925, Sept. 21. Abrasive grains of hard and tough porcelain are used with a bond of vitrified ceramic material softer than the porcelain.

Burning clay ware in tunnel kilns. W. D. RICHARDSON. U. S. 1 599,589, Sept. 14. The ware is subjected to a series of hot gases which move in opposite directions transversely of the kiln.

Drawing rods, strips, etc. from fused silica. THERMAL SYNDICATE, LTD., R. W., CLARK and L. SAMPLE. Brit. 241,426, Jan. 24, 1925.

Forming tubes, rods, etc. of fused silica. BRITISH THOMSON-HOUSTON CO., LTD. Brit. 241,544, Oct. 20, 1924. Mech. features.

Abrasive cement. H. O. KEAY. Can. 260,384, May 4, 1926. An abrasive cement consists of fine sand approx. 90 parts, phenolic formaldehyde resin 10 parts, furfural solvent $3^1/_3$ parts, and EtOH approx. $2^1/_2$ parts, by weight, all thoroughly mixed and kneaded together. Cf. *C A* 19, 713.

20—CEMENT AND OTHER BUILDING MATERIALS

J. C. WITT

Ferrous and aluminous cements: considerations on hydraulic compounds. ERNEST MARTIN. *Non. sci.* [5] **16,** 97–101 (1926); cf. *C. A.* **18,** 741, 3454; **19,** 1041; **20,** 2570.—M. considers that the theory which attributes the hydraulic properties of portland cements to tricalcium silicate and to tricalcium aluminate is entirely wrong, that the compds. of SiO_2 with CaO are much more complex and contain several Si atoms in the mol., that tricalcium aluminate does not exist in portland cements, and that in the course of clinkering the Al_2O_3 of the Al silicates enters into highly complex reactions with formation of compds. contg. Al_2O_3, SiO_2 and CaO. Absence of tricalcium aluminate in portland cements follows from expts. reported at the last French Chemical Congress (as yet unpublished). Hydraulic properties are essentially an attribute of CaO, and to a much slighter extent of MgO. Hydraulic cements are the insol. or almost insol. inorg. CaO compds. which can be hydrated or hydrolyzed, and include certain silicates, the aluminates, certain ferrites and certain titanates; but similar salts of the same acids with other bases, *e. g.*, BaO or SrO, are quite devoid of hydraulic properties. Till recently it was admitted that in cement making Fe_2O_3 acted merely as a flux, the Ca ferrites having no hydraulic properties. M has found that all fused Ca ferrites are devoid of hydraulic properties, irrespective of their CaO contents; but of the unfused ferrites 3

($2Fe_2O_3.5CaO$, $2Fe_2O_3.6CaO$, $2Fe_2O_3.7CaO$) have hydraulic properties, while those with either higher or lower CaO contents are not hydraulic. The hydraulic ferrites are prepd. by heating a mixt. of theoretical proportions of Fe_2O_3 and CaO below the m. p.; if the temp. is raised to or near the m. p. the hydraulic properties are destroyed. The product, variously known as fused, elec., or aluminous cement, which is prepd. by fusion of bauxite in presence of CaO, owes its properties to certain Ca aluminates. M. has found that hydraulic Ca aluminates could also be prepd. without fusion, thus allowing of the manuf. of unfused and even unclinkered aluminous, ferrous or alumino-ferrous cements at a cost much lower than that of ordinary fused cement, and approximating or slightly lower than that of portland cements. Raw materials particularly suitable for the purpose are bauxite, waste sludges from Al_2O_3 plants, and cinders from pyrites furnaces. They are burned below the m. p. of mixts., generally about 1100-400°, so that they are discharged from the kiln in a pulverulent or slightly agglutinated condition. By avoiding fusion of the SiO_2 present as an impurity, inactive Ca silicates are produced, which are not attacked by natural waters; whereas if the SiO_2 were fused it might give compds. which would facilitate corrosion by gypsum-bearing waters. Unfused cements do not expand after setting, as sometimes do both fused and portland cements. By judicious proportioning of the ingredients, the properties of the finished product, particularly as regards time of setting, strength and resistance to sulfate-bearing waters, can be modified at will. M. disagrees with Candlot's opinion that destruction of portland-cement concretes is due to the formation of a Ca thioaluminate, for the 2-fold reason that portland cements contain no Ca aluminate and that both fused and unfused aluminous cements, which contain Ca aluminate and give thioaluminates with $CaSO_4$, are not destroyed by sulfate-bearing waters. Mortar made from unfused aluminous (free from, or low in, Fe_2O_3) cement and bauxite is highly refractory and does not disintegrate at the highest temp. encountered in industrial furnaces. A. Papineau-Couture

Cement materials from Nyassaland. Anon. *Bull. Imp. Inst.* **24**, 303–18(1926).—Particulars are given regarding deposits of which samples were sent to the Imp. Inst., and results of the analysis and tests of these materials from the standpoint of the manuf. of hydraulic lime and cement. A. Papineau-Couture

Uses for copper slag in construction work. E. E. Thum. *Eng. Mining J.-Press* **122**, 285–8(1926).—Cu blast-furnace slags are not as generally useful as are Fe blast-furnace slags, but some kinds form a satisfactory concrete aggregate. In the crushed or granulated form these slags are of little value, but molten slag is useful in building massive foundations, when switch tracks are not too costly. The cost of building slag block in an individual case is itemized. W. H. Boynton

Activation of inert varieties of calcium sulfate. P. P. Budnikov. *Compt rend.* **183**, 387–8(1926).—The natural anhydrite and the $CaSO_4$ obtained by burning gypsum from 400° to 750° do not set in contact with water, but certain catalysts give them this property. Among the various substances tried $KHSO_4$, $NaHSO_4$, CaO, $(NH_4)_2SO_4$ and Na_2SO_4 are the best catalysts. Raw material, ground 9000 mesh/cm.^{2}, contg. 0.3 part per 100 of catalyst, gave a mortar with a resistance of 70 kg./cm.^{2}

Van den Bossche

Report of Committee 17. Wood preservation. S. D. Cooper, *et al.* *Am. Ry. Eng. Assoc.* **1926**, 913-1001.—*Revision of the Manual.*—For creosote distn. the retort is replaced by a flask (84 mm. inside diam.) with short neck (43 mm. long and 22 mm. in diam.) and side-neck tubulature (22 cm. long and 10 mm. in diam.). The method of detg. the coke residue is revised. A covered Pt crucible (20 to 30 cc.) is substituted for the glass bulb. *Treatment of Douglas fir.*—A complete treatment specification for fir is presented. *Service test records.*—The Com. presents a revised and extended table of tie renewals per mile on 24 railroads. The revised table of completed service records of ties compiled by the U. S. Forest Service is printed in full. *Marine piling investigations.*—A progress report of the tests now under way is presented, including tests on woods naturally resistant to marine-borer attack, tests of specimens impregnated by the Chem. Warfare Service and tests of specimens treated with creosote and fractions of creosote. *Treatment of signal trunking and capping.*—Complete specification for the creosoting of this class of material is presented.

Alfred L. Kammerer

Report of Committee 4. Preservatives. L. C. Drefahl, *et al.* *Proc. Am. Wood Preservers' Assoc.* **1926**, 38–77.—An alternative standard *method of detg. water in creosote* is presented. The oil is mixed with equal parts of coal-tar naphtha and distd. A trap connected to a reflux condenser collects and measures the water, returning the solvent to the still. *Low-temp. tars.*—The production of tar from low-temp. carbonization is still too limited to be a factor in timber preservation. Seven plants of com.

Concrete. I. F. Shellard. Brit. 241,724, Nov. 12, 1924. Concretes which can be rammed into temporary molds and left to set after the mold is dismantled are formed of limestone or other stone dust or sand, clay, stone chippings and portland cement, mixed dry and then rendered just plastic with H_2O.

Composition for treating concrete. N. C. Johnson. Can. 258,504, Mar. 2, 1926. Concrete surfaces are treated with a viscous colloidal compn. comprising a reagent, other than a mineral acid, which will prevent the setting of the cement, and a colloidal vehicle in which the reagent is incorporated.

Concrete bricks. C. S. Wert. Can. 259,153, Mar. 23, 1926. A concrete block is formed having a surface faced with a compn. of concrete and coloring minerals, the compn. being sprinkled on the moistened surface and then sprayed with $MgCl_2$ soln. contg. Na_2SiO_3; the elements of the facing penetrate into the brick and form a thorough bondage between the facing and the brick.

Waterproofing portland cement concrete. E. C. F. Lord. U. S. 1,599,903, Sept. 14. Paraffin emulsified with kerosene and soap H_2O is added to the H_2O used for mixing the cement.

Lime hardening and waterproofing composition. D. M. Harrison. Can. 258,066, Feb. 9, 1926. A hardening compd. for lime products consists of a waterproofing constituent, a greaseless metallic constituent having a high C content, and a water-absorbent constituent, the last mentioned constituents being relatively chemically reactive when mixed with the lime product. Cf. *C. A.* 19, 2397.

Silica and lime in water mixture. H. A. Endres. Can. 262,986, July 27, 1926. A finely divided material is made by mixing disintegrated diatomaceous earth with sufficient lime to combine therewith, producing a reaction by heating the mixt. in the presence of water, and subjecting the product to the action of CO_2.

Limestone burning process. J. K. Kiddle. Can. 262,117, June 29, 1926 Very finely ground $CaCO_3$ is subjected to a heat of approx. 850° in the presence of a catalyst such as O_2 to convert it to CaO.

Artificial stone. H. C. Harrison and C. H. Harrison. U. S. 1,599,413, Sept. 14. Stone material is mixed with H_2O and lime, the mass thus produced is dried, then wetted with H_2O and treated with CO_2 under increasing pressure.

Artificial stone. Siemens & Halske Akt.-Ges. Brit. 241,576, Oct. 17, 1924. Asbestos, oxides, sulfides, nitrides, silicates, blast-furnace slag, waste from cement manuf. or other inorg. substances of suitable character are heated nearly to the m. p. and subjected to high pressure.

Apparatus for making wall board, etc., from pulped cornstalks and waterproofing substances. M. Skolnik. U. S. 1,599,253, Sept. 7.

Building blocks or tile, etc. J. F. Makowski. U. S. 1,600,552, Sept. 21. An ingredient such as clay is added to facilitate the slipping of a gypsum-sawdust compn. through shaping dies.

Composition for floors, filling cavities in trees, etc. F. A. Bartlett. U. S. 1,598,636, Sept. 7. Sawdust 4–16, asbestos 1 part, portland cement, a small quantity, asphalt, tar or similar bituminous material and water glass.

Paving and surfacing material containing rubber. C. E. Ramsden. U. S. 1,598,-505, Aug. 31. Crushed granules of flint or other material of a low degree of porosity are combined with rubber latex in the proportion of about 20 gals. latex per ton of the crushed granules.

Apparatus for producing road-making or other compositions from asphalt and clay or similar materials. G. B. Poore. U. S. 1,600,948, Sept. 21.

Asphalt material. J. D. Forrester. Can. 260,219, Apr. 27, 1926. An asphaltic road mixt. is made by drying crushed stone to eliminate the moisture therefrom, adding a light solvent oil and asphaltic binder.

Wood substitute. H. C. Harvey and H. L. Becher. Can. 260,218, Apr. 27, 1926. A sheet formed from fiber and finely divided red gum with the aid of a water vehicle is dried, and compressed at a temp. sufficiently high to render the gum plastic.

Impregnating wood. Etablissements P. Noe et Cie. Brit. 241,550, Oct. 16, 1924. Telegraph poles or like articles are impregnated as an entirety with creosote, $CuSO_4$ or other material and the portion of the pole to be placed in the ground is then subjected to a further impregnation. A tilting autoclave may be used for the treatment.

Impregnating wood with sulfur. W. H. Kobbe. U. S. 1,599,135, Sept. 7. Wood in its natural state is immersed in a S bath at a temp. of about 140-50° until substantially all moisture has been driven out of the pores of the wood and the temp. of the bath is then reduced to about the m. p. of S and the pores of the wood are permitted to become

filled with S and the latter is allowed to congeal in the wood. U. S. 1,599,136 specifies railway ties formed of redwood or other relatively soft wood impregnated with S.

Preventing sap staining and molding of wood. E. BATEMAN and E. E. HUBERT. U. S. 1,598,699, Sept. 7. Wood is impregnated with an aq. soln. of an alkali phenolate which will react on contact with air to form an alk. carbonate and a free phenol which is dissipated by the air upon evapn. of the H_2O.

Kiln for drying lumber, etc. H. WATKINS. U. S. 1,598,466, Aug. 31.

21—FUELS, GAS, TAR AND COKE

A. C. FIELDNER

Notes on recent developments in fuel technology. R. WIGGINTON. *Fuel Science Practice* **5**, 371–6(1926); cf. *C. A.* **20**, 3070.—Short reviews on the following subjects: smoke abatement, domestic heating by oil, shale oil, heat-sensitive paints, C_6H_6 recovery, excess air in boiler furnaces, phenols in NH_3 liquor, heat of adsorption of gases by coal, scientific and industrial research council of Alberta. D. A. R.

An investigation of the behavior of solid fuels during oxidation. II. BURROWS MOORE AND F. S. SINNATT. *Fuel Science Practice* **5**, 377–80(1926).—Changes in ignition properties of coal resulting from storage were detd. for 4 coals, by means of an app. previously described (cf. *C. A.* **19**, 2398). Time intervals for the following phenomena to occur were recorded: (*a*) beginning of distn. of volatile matter; (*b*) glowing of the coal; (*c*) ignition of volatile matter (*d*) complete combustion of the coal. With freshly mined coal (*b*) and (*c*) occur almost simultaneously over a wide temp. range. With coal that had been stored one year a definite interval elapsed between (*b*) and (*c*). With coal stored 2.5 years (*b*) and (*c*) would not occur except at higher temps. D. A. R.

Solid smokeless fuel. WM. E. DAVIES. *Engineering* **122**, 241(1926).—A general discussion. W. B. PLUMMER

The characteristic of the reactivity of fuels and the behavior of these by dust firing with regard to the so-called "volatile matters." M. DOLCH. *Die Wärme* **49**, 491–5, 515–8(1926).—The present work is an attempt to find a proper characteristic for fuels detd. for dust firing with regard to the gas content. The previous suggested "gas heat value no." or the amt. of heat created by gas, indicated in % of the total calorific value, is proved by systematic investigations not to suffice for the valuation of fuels and must be refused as it leads to false considerations, nor does it embrace the actual decisive factors. In spite of the unmistakable relation between the gas content of a fuel and its more or less decided qualification for dust firing, D. points out that, *e. g.*, the high gas content of lignite might well be claimed as a characteristic for the nature of this fuel, but hardly as a cause for its easier combustibility. The range of the 2 fundamentally different processes of combustion—evolution of gas and its combustion and the combustion of the degassed residues—seemed hardly liable to essential variations when natural fuels were used, as the amt. of heat created by the gas in lignite and coal showed no particular differences. The greater difference in the behavior of these fuels on combustion in dust form is primarily to be sought in the structure of the crude fuel and in the structure of the degassed residues, thus the chem. influences step in all cases strongly to the rear. D. THUESEN

Flue-gas analyses and heat balances with solid and liquid fuels. H. KOLBE. *Brennstoff und Wärmewirtschaft* **8**, 253–62 *et seq.*(1926).—A general discussion of methods of computation. W. B. PLUMMER

Air heating in the steam boiler plant. SCHLICKE. *Die Wärme* **49**, 368(1926).—An air preheater was inserted after the economizer in an old boiler plant with a circulation boiler of 450 sq. m. heating surface and 15 sq. m. traveling grate surface. The air heater which had a 420 sq. m. heating surface was inserted so that the flue gases passed through vertically and the air horizontally. The gases were cooled from 240° to 150°; the air was heated from 20° to 115°. An increase of 3.5–4% was brought about in the total boiler efficiency, equal to about 5% saving in coal. Furthermore the boiler pressure increased 15%. A 25% faster initial combustion was noted and proved to be without danger to the escape of heavy hydrocarbons to the flue. The difficulties which may occur by this operation are discussed and means for the elimination of these are suggested. Corrosion of the parts in the wrought-iron preheater could not be observed after $1^1/_2$ years' operation. D. THUESEN

Briquetting of waste and investigations of the calorific value of briquets of waste materials. OTTO BRANDT. *Die Wärme* **49**, 535–7(1926).—A briquetting plant for waste from wood, hemp, flax, tanbark and sugar-cane residues is described. Analyses of

briquets of oak and pine, peat, mixts. of wood and peat, wood and cokes and wood and small-coal are given. D. THUESEN

Recovery of fuel from ashes by the dry magnetic process. ULLRICH. *Gas u. Wasserfach* **69**, 697–8(1926).—Operating costs are estd for 2 German plants; a large net profit is shown. W. B. PLUMMER

Rotary flue-gas-heated drum driers in the brown-coal industry. E. PALKOWSKY AND K. D'HUART. *Braunkohle* **25**, 349–57, 373–80(1926).—Various types of app. and methods of operation are described, and tables and charts for computation of drier capacity, efficiency, etc., when operating on brown coal are given. W. B. PLUMMER

Occurrence, properties, and utilization of brown coal in Italy. A. FABER. *Braunkohle* **25**, 357–60(1926).—Tabulated data are given showing estd. total deposits, production and consumption (1910–1924), and approx. compn of the various deposits W. B. PLUMMER

The influence of the physical and chemical properties of brown coals on their briquetting. KEGEL. *Braunkohle* **25**, 389–95(1926).—A general discussion. W. B. P.

The fossil resin of brown-coal bitumen. HANS STEINBRECHER. *Braunkohle* **25**, 395–400(1926).—Review and discussion of results of various workers. W. B. P.

Powdered-brown-coal firing. P. ROSIN. *Braunkohle* **25**, 414–35(1926).—A discussion of various boiler setting and burner arrangements, etc., for firing powd. brown coal, various observed and theoretical results being tabulated. W. B. PLUMMER

Electrostatic precipitation in brown-coal-briquet plants. VOIGT. *Braunkohle* **25**, 435–64(1926).—Sketches and diagrams are given of a large no. of installations for dust pptn. on the waste flue gas from rotary brown-coal driers, etc. The method is proving very successful, much of the earlier difficulty with dust explosions having been eliminated by changes in construction and arrangement of filters. Some operating data are tabulated. It may be noted that in one installation the current was 4 milliamp. at 40,000 v. and the breakdown potential 55,000 v. if no dust was present in the gas, while with dust present the current at 40,000 v. was 55 milliamps. and the breakdown potential 47,000 v. W. B. PLUMMER

The Lurgi process for smoldering of lignite. OETKEN AND HUBMANN. *Die Warme* **49**, 455–7(1926).—A smoldering process for lignite, working at about 500° with the evolution of only small quantities of gas, is described and illustrated. D. THUESEN

Lignite firing with supplementary dust. L. FINCKH. *Die Warme* **49**, 379–84 (1926).—From expts. on lignite firing with supplementary lignite dust it is concluded that optional increases in boiler power cannot be obtained on optional addns. of dust A crit. point in the addn. was observed, which varied according to the normal grate charge, the size and form of the fire box and the quality of the lignite. In an expt. with a tube boiler of 750 sq. m. heating surface and 43.73 sq. m. step grate surface an addn of 12.63% dust per hr. came close to the crit. point, while in an expt. with a boiler of 425 sq. m. heating surface and 29.7 sq. m. grate surface an addn. of 6.66% dust per hr. seemed to overstep the crit. point. With the proper amt. of dust, which also had a favorable action on the fire and increased the grate charge, an increase in power could be obtained in a few min. Too heavy addn. of dust rendered the size and form of the fire box inadequate; considerable disturbances resulted, and in spite of increased fuel consumption, the boiler power might even go below normal. D. THUESEN

Necessity and direction for coal studies. M. DOLCH. *Brennstoff und Warmewirtschaft* **8**, 221–3, 239–42, *et seq.*(1926).—A general discussion of carbonization problems, particularly as concerning German brown coals. W. B PLUMMER

The constitution of coal. R. V. WHEELER. *J. Soc. Chem. Ind.* **45**, 307–10T (1926).—"The essential simplicity, chemically, of coal rather than its complexity," is pointed out. Chem. studies of the nature and compn. of plant tissues were used as the basis for studies on the constitution of coal derived ultimately from similar tissues. H. L. OLIN

Ash and sulfur in Iowa coals. H. L. OLIN AND J. R. TROELTZSCH. *Iowa Geol. Survey* **31**, 157–65(1926).—Complete lab. tests on 6 typical Iowa coals were made to det. the amt. and character of their sulfur and ash. Mean values for S were pyrite 2.66%, sulfate 0.29%, organic 1.86%. Float and sink washing tests on the same coals showed that in order to reduce av. total S from 4.83 to 3.04% and av. ash from 12.21 to 8.35%, it is necessary to discard 23.4% of the original tonnage. Of this, however, 10.3% is ash and S, so that only 13.1% of the original pure coal is discarded or converted into low-grade material. H. L. OLIN

The oxidation of the constituents of a resinous Utah coal. J. D. DAVIS AND D. A. REYNOLDS. *Fuel Science Practice* **5**, 405–11(1926).—A non-coking, resinous coal from the Mesa Verda bed, Castlegate, Utah was resolved by Fischer's method (cf. *C. A.*

19, 2402) of C_6H_6-pressure extn. and petr.-ether sepn. of the ext. into 3 constituents: (1) insol. residue (88.5%); (2) oily bitumen (5.7%); (3) solid bitumen (1.9%). Each of these constituents and the raw coal were oxidized for 100 hrs. at 60° in a special app., which is described and illustrated. The course of the oxidations was followed by detn. of the rates of (1) O_2 absorption; (2) CO_2 evolution; (3) H_2O evolution. In each test there was a high initial rate of O_2 absorption followed by a slow and gradually decreasing rate. That each of the 3 coal constituents oxidized more rapidly than the raw coal was evidenced by their higher O_2 absorption rates and also by their more rapid evolution of CO_2 and H_2O. All portions of this coal take part in autoxidation and the rate of oxidation of any portion of coal is dependent primarily upon the amt. of surface exposed. D. A. R.

The cleaning of coal. VI. W. R. CHAPMAN AND R. A. MOTT. *Fuel Science Practice* **5,** 386–404(1926); cf. *C. A.* **20,** 2240, 2573, 3071.—A history of the development of the Baum washer is given and the present-day type and its working are described. Various types of jig washers (American and English), are discussed in detail. 16 illustrations are included. D. A. R.

Volatility tests for automobile fuels. T. S. SLIGH, JR. *J. Soc. Autom. Eng.* **19,** 151–61(1926); cf. *C. A.* **20,** 2572.—Previous methods of detg fuel-volatility are reviewed The equil. air-distn. method is described in which fuel is distd. in the presence of a known wt. of air. Unevapd. fuel is drained off and measured. The distn. curve for the fuel in any desired air-fuel mixt. is thus detd. Ratings of operating and starting volatility of fuels in terms of the % vaporized are given. M. B. HART

Motor-fuel value of natural gasoline. E. H. LESLIE AND G. G. BROWN. *Oil & Gas J.* **25,** No. 3, 120–1, 132(1926).—Tests were conducted on blended fuels contg 0, 10, 25, 50, 100% straight-run natural gasoline to det the ease of starting and freedom from back-firing, acceleration tests, road tests and antiknock properties. The results which are tabulated and presented graphically show that natural gasoline blended with straight-run Mid-Continent gasoline is equiv. to $^2/_3$ as much benzene in blends contg. not more than 50% of natural gasoline M. B. HART

Fuel from the service standpoint. T. A. BOYD. *J. Soc. Autom. Eng.* **18,** 641–8 (1926).—The nature of gasoline and the sources of the world's supply are discussed. Service problems arising from the use of gasoline include resin formation, dirt accumulation and the presence of water. Remedies are discussed. M. B. HART

Alcohol as motor fuel in Germany. W. GENTSCH. *Brennstoff und Wärmewirtschaft* **8,** 261–4(1926).—An economic discussion, in general favoring attempts towards its adoption as possible. W. B PLUMMER

Alcohol as motor fuel. SCHWARZ. *Z. Spiritusind.* **48,** 327–8, 393–5(1925); **49,** 33, 101–2, 110–1, 177–8(1926).—To mixts. of alc. and petroleum derivs. are made addns which (1) increase the action and miscibility of alc., such as benzene, gasoline, naphtha and ether, (2) increase the ease of combustion, such as nitrobenzene, acetylene and ether, (3) are of an explosive nature, (4) are of other kinds. Numerous addn. materials are listed. In all mixts. where alc is used, it must be H_2O-free; the dehydration is obtained by means of CaO or CaO_2. Distillates from the large container are carried into small containers with more lime. If CaC_2 is used, some acetylene in alc results, to which CH_3COCH_3 may be added. Fuels which contain corrosives such as CS_2, CO_2, etc., may be corrected by adding oleic or abietic acid or by adding CaO or $CaCO_3$ and distg. To lower the ignition temp. of alc. or gasoline, addns. of CH_3COCH_3 or ether satd. with C_2H_2 may be made. The use of ether as a homogenizing material is universal, but AmOH is the most satisfactory. Ethyl acetate, BuOH benzene, cresol, toluene, nitrobenzene have also been used. Addns. which increase inflammability are ether and AcH. Dehydrating substances for alc. such as light petrol produce good effects. The addn. of C_2H_2, water gas, etc., can be simulated by the addn. of $(CH_3)_2NH$. H_4NO_3 is added to increase inflammability and H_2O absorption. A large no. of patents are cited. C. N. FREY

Audibility anti-knock tests and knock-intensity evaluation. DANIEL ROESCH. *J. Soc. Autom. Eng.* **19,** 17–8(1926).—A method for conducting audibility anti-knock tests of motor fuels is described. M. B. HART

The new gas works at Singen am Hohentwiel. SCHUSTER. *Gas u. Wasserfach* **69,** 781–4(1926).—Description of a new vertical retort plant. W. B. PLUMMER

New water gas sets (Société d'éclairage, chauffage, et force motrice). A. BARIL. *J. usines gaz* **50,** 321–31(1926).—An illustrated description of new sets having waste-heat boilers, water-jacketed and self-clinkering generators, and automatic controls. No detailed operating results are given. W. B. P.

Tests of a central producer plant of the A. V. G. system at Berlin-Neukölln. ANON.

(Gas Institute) *Gas u. Wasserfach* **69**, 719–21(1926).—Av. daily data were: total coke fuel 37.32 metric tons (3 generators) or 98 kg./sq. m./hr., ash 6.21 metric tons/day contg. 7.3% combustible, gas make 5831 cu. m./hr. or 5.16 cu. m./kg. ash-free coke. Av. compn. of coke 9.3% H_2O, 17.6% ash, 73.1% coke; av. gas compn. 5.1% CO_2, 0.3% O_2, 28.9% CO, 12.5% H_2, 0.4% CH_4, 52.8% N_2, gross heating value 1295 kg. cal./cu. m., net 1231. Efficiency, based on gross heating value of cold clean gas referred to coke input, 84%. W. B. PLUMMER

Refractories for oil gas generators. J. T. CREIGHTON AND M. J. CEREGHINO. *Gas Age-Record* **54**, 826–8, 860–2, 894–6(1924). H. G.

The Burkheiser gas-purification process. W. BURKHEISER. *Gas u. Wasserfach* **69**, 765–71(1926).—The absorption agent is a suspension of Fe_2O_3 in a dil. NH_3 soln., H_2S, NH_3 and CN derivs. being removed simultaneously, and the suspension finally regenerated with recovery of all by-products by blowing with air. W. B. PLUMMER

Motor trucks operating on producer gas. Franco-Belgian contest of 1925. JOSEPH AUCLAIR. *Recherches et inventions* **7**, 557–99(1926); cf. *C. A.* **16**, 2214; **18**, 2069.—A very detailed description of the rules of the contest, the competing trucks and gas producers with which they were equipped, and the results of the contest, which was eminently successful. The article, which contains much interesting and valuable information, cannot be abstracted. **Determination of carbon monoxide in the atmosphere of the trucks.** CAMBIER. *Ibid* 600–9.—Analysis of a large no. of samples of the atm. of the trucks taken during the course of the contest showed: (1) while the trucks were running normally, there was never found sufficient CO to cause mortal accidents, even after breathing for several hrs. consecutively; (2) very exceptionally, particularly when going down very long hills, traces of CO were found which, though much smaller than the toxic dose, are not negligible; (3) when the trucks are stopped and the motors are kept running at low speed, and especially when the producers are opened to charge with fuel, amts. of CO approaching the toxic limit can find their way into the atm. of the truck. Assuming that under proper running conditions the compn. of the exhaust is substantially the same as that of a gasoline engine, the only additional danger with producer-gas engines is that due to the very high initial CO content of the producer gas. A. P.-C.

The problem of seal fluid for piston-type gas holders. FRIEDRICH PISTOR. *Gas u. Wasserfach* **69**, 586–9(1926).—Coal tars and tar oils are unsatisfactory on account of their tendency to emulsification and thickening. Special prepns. of bituminous solns. in oil ("Immunol") are stated to be much more satisfactory. The properties of the various oils discussed are tabulated. W. B. PLUMMER

Natural gas in Siebenbürgen. M. SCHMIDT. *Gas u Wasserfach* **69**, 675–7(1926).—The total production of the 8 principal wells is 1,030,000 cu. m./day, the gas being almost pure CH_4. Existing distribution systems are described and the present and possible future utilization is discussed. W. B. PLUMMER

Gaseous fuel for airships. ANON. *Engineer* **142**, 119–20(1926).—The implications of the use of a gaseous fuel for airships are discussed. A fuel having the same d. as air would require no H to lift it and its consumption would not affect the buoyancy of the ship. By its use the blowing-off of H could be avoided. D. B. DILL

Liquid purification of coal gas with recovery of sulfur. HUREZ. *Chimie et industrie* **16**, 200(1926).—Controversial with Harnist (*C. A.* **20**, 2242). HARNIST. *Ibid* 200–1.—Reply to Hurez. A. PAPINEAU-COUTURE

Sulfur as a by-product of gas. C. J. GEIGER. *Fertilizer Green Book* **7**, No. 9, 20–3(1926).—S as a by-product in the manuf. of gas from coal and petroleum is collected as a thick foam on the surface of a special washing soln. and is filter-pressed to a paste contg. approx. 60% H_2O. The compn. of the dry material is 85–95% S, 3–5% hydrocarbon residue, and small amts. of C and inorg. salts, chiefly Na compds. The S is obtained in the form of a hydrophil colloid. In consequence of its fine state of division and its content of hydrocarbons, it is a more effective fungicide than ordinary S. It appears to render ground raw-rock phosphate available as plant food more rapidly when mixts. of the two are used as fertilizer than when ordinary S is used. K. D. JACOB

Low cooling for removal of naphthalene, etc., from coal gas. F. LENZE AND RETTENMAIER. *Gas u. Wasserfach* **69**, 689–91(1926).—Results are given for an exptl. app. (300 cu. m./hr.) in which coal gas is cooled to 0° to —2° from an initial temp. of 10–30° by the use of cooling coils in which liquid NH_3 is expanded. The $C_{10}H_8$ is reduced from 30–60 g./100 cu. m. to 4–6 g., the crude material removed from the app. contg. also about 20% light oil. The NH_3 content of the gas before cooling was 170–400 g./100 cu. m., after cooling 80–150 g. The aq. condensate from the app. contained 70–105 g. NH_3/l.; a typical analysis of this was NH_3 96 g./l., CO_2 129, S 4.9, HCN 0.3. No cost data are given. W. B. PLUMMER

Recovery of phenols from gas liquors. R. M. CRAWFORD. *Blast Furnace and Steel Plant* **14,** 400–1(1926).—Operation of the Troy (N. Y.) plant (cf. *C. A.* **20,** 1313) for continuous extn. of phenols from gas liquors by C_6H_6 has been continuous and successful. The NaOH soln. used to ext. the phenols from the C_6H_6 is now neutralized by $NaHCO_3$ (instead of CO_2 or H_2SO_4) and the spent soda ash soln. formed is used in the Seaboard liquid gas purifying unit. This spent soln. increases the efficiency of the liquid purification from 85% (with solns. made up from com. soda ash) to 90–5%, which is attributed to surface-tension effects caused by the small amts. of phenols residual in the spent soln. W. B. PLUMMER

Synthetic oils from coal gasification products at ordinary pressure. ERICH KÖNIG. *Teer* **24,** 385–7(1926); *Brennstoff und Wärmewirtschaft* **8,** 228–9.—Non-critical review of Fischer's recent work on oils from water gas (*C. A.* **20,** 2065) W. B. PLUMMER

Gasoline substitutes from coal. A. C. FIELDNER. *J. Western Soc. Eng.* **31,** 306–15(1926).—Brief discussion of low-temp. carbonization and of synthetic products from water gas. W. B. PLUMMER

The Hermy tar distillation process. I. GINSBERG. *Refiner & Nat. Gasoline Mfr.* **5,** No. 6, 30(1926).—In the Hermy semi-continuous process for the dehydration of tar, waste heat liberated during the distn. is used and the tar is dehydrated with the aid of heat in a continuous operation under vacuum. M. B. HART

Nomenclature of tars and bitumens. W. REINER. *Teer* **24,** 356(1926); H. MALLISON. *Ibid* **356.**—Continuation of discussion, cf. *C. A.* **20,** 810, 2903. W. B. P.

Critical consideration of new types of brown coal carbonizing retorts. A. THAU. *Braunkohle* **25,** 545–65(1926.)—Brief description and critical discussion of a no. of processes, a large proportion of which are modifications of the well-known Rolle retort. W. B. PLUMMER

Selection of coals for coke manufacture. H. J. ROSE. *Blast Furnace and Steel Plant* **14,** 344–9, 366, 390–5(1926).—A general discussion with many micrographs and photographs illustrating coke properties from various coals under different conditions. Classification of coals by tri-axial compn. (H:O:C) diagrams is illustrated and discussed. Recent advances in coke-oven design and practice in general make possible the prepn. of satisfactory cokes from much wider ranges of coals than was previously possible; for example, a Utah plant is producing good furnace coke from a coal contg. 40% volatile matter and 10% O (ash-free basis). Interesting results are shown for tests on samples carbonized in metal boxes placed in com. coke ovens. W. B. PLUMMER

The coking propensities of coals. W. A. BONE. *Chemistry and Industry* **45,** 646–7(1926).—B. maintains in opposition to F. Fischer that the brown powder obtained as benzene ext. IV is the coking constituent of coal rather than the reddish oily fraction I. He reviews the exptl. evidence upon which his judgment is based. H. L. OLIN

Coal blending: a review. DAVID BROWNLIE. *Petroleum Times* **15,** 937–8(1926).—A brief review of the following low-temp. carbonization processes is given: "Carbocite Dual Carbonization," or "Wisner" process; "Coalite"; Delkeskamp Dobblestein; Fellner and Ziegler; "Allkog"; "Kohlenscheidungs Gesellschaft"; McLaurin; Midlands Coal Products; Nielsen or "L. N."; Pure Coal Briquette; Raffloer; Smith "Carbocoal"; Stavely Coal & Iron Co.; Summers continuous coking; Tozer; and Thyssen. Also in *Gas Age-Record* **57,** 801–3, 810, 843–7, 871–8(1926). M. B. H.

The coking of lignites. H. ROMBERG. *Braunkohle* **25,** 329–35(1926).—A review of exptl. data, considered mainly from the standpoint of the possible use of the coke as blast-furnace fuel. W. B. PLUMMER

Determination of the fineness of coal dust (GREIG) **24.** Enriching ores and coal (Can. pat. 258,537) **9.** Apparatus for distillation of carbonaceous materials (Brit. pat. 241,659) **1.** Sewage-purification tank and gas generator (U. S. pat. 1,599,731) **14.**

Fuel. J. M. W. KITCHEN. U. S. 1,598,086, Aug. 31. A fractionated hydrocarbon oil product such as fuel oil and pitchy material is heated and coked fuel particles are dipped in it and then cooled.

Tablet fuel. T. G. BLACKLOCK. U. S. 1,599,948, Sept. 14. Gasoline is mixed with melted paraffin and with cotton fiber and the mixt. allowed to solidify.

Heavy fuels in internal-combustion engines. F. L. MAEDLER. U. S. 1,597,917, Aug. 31. An air charge is compressed in a working cylinder and a closed chamber is filled with practically inert hot combustion gases under pressure. A partially prepd. metered quantity of fuel such as crude oil or still residue mingled with a gaseous medium is forced into the chamber contg. the hot gases under pressure so that the prepn. of the

fuel is completed in this chamber and the charge is simultaneously compressed and displaced into the compressed air charge in the working cylinder.

Motor fuel. C. O. JOHNS. Can. 262,024, June 22, 1926. A motor fuel comprises a mixt. of 70–95% gasoline, 5–30% benzene and Pb tetraethyl in the amt. of 1/2 cc. per gal. of the mixt.

Liquid fuel. C. O. JOHNS. Can. 262,023, June 22, 1926. A motor fuel comprises a mixt. of 90–97% gasoline and 3–10% alc., and lead tetraethyl in the amt. of 1/2 cc. per gal. of the mixt.

Fuel briquets. G. PLOCHMANN. U. S. 1,600,065, Sept. 14. Lignitic brown coal of woody structure is subjected to a preliminary drying (which is cut short of the degree which would render the material actively hygroscopic) and is then treated with gases or vapors from the distn. of bituminous material, and pressed into briquets.

Fuel briquets. E. GOUTAL and H. HENNEBUTTE. Brit. 241,899, Oct. 24, 1924. A binder for briquets of coke or other materials is obtained by mixing oxidized tar or pitch, *e. g.*, pyroligneous tar, with pitch or tar which is hydrogenized or but slightly oxidized, *e. g.*, coal tar or petroleum tar, and heating the mixt. to 180–250° with or without treatment with an oxidizing gas or a catalyst such as oxides of Fe, Cu or Ni.

Fuel carbonizing and gasifying process. G. STADNIKOV. Can. 261,936, June 22, 1926. Oxygenic org. compds., or mixts. of such with other org. compds., are reduced by passing their vapors at temps. between 390° and red heat, over C in which metals have been incorporated (metallized coal).

Gas-production and carbonization of solid fuel. W. W. ODELL. U. S. 1,598,217, Aug. 31. Fuel is passed substantially continuously in a downward direction through a confined combustion zone, ignited in the zone during its downward passage and maintained in a state of ignition by drawing air from without into an outer substantially cylindrical surface of the fuel at a plurality of levels. Resulting gases are removed at a plurality of levels by exhausting through gas offtakes located within the fuel.

Controlling furnace combustion. J. H. GILLOOLY. U. S. 1,599,410, Sept. 14. Flue gases are elec. heated and mixed with alc. vapor to effect combustion of unconsumed material which they still contain and the resulting increased temp. of the flue gas is utilized to control the supply of fuel to the furnace.

Apparatus for drying peat. L. BROWN and W. L. BROWN. U. S. 1,599,952, Sept. 14.

Gas producer operation. A. BREISIG. Brit. 241,902, Oct. 21, 1924. In gas producer operation in which part of the gas generated is passed through a superheater and then brought into contact with the fresh fuel, as described in Brit. 207,561 (*C. A.* **18**, 1556) the heat so returned to the producer is sufficient to yield a surplus of coke which is removed continuously.

Gas producer. A. H. LYMN and N. E. RAMBUSH. U. S. 1,599,022, Sept. 7.

Gas producer. J. F. ROGERS, E. R. YOUNG and R. WETHERILL, JR. U. S. 1,599,587, Sept. 14.

Apparatus for generating gas from crude oil, tar, pitch, etc. B. F. B. SEWELL. U. S. 1,598,319, Aug. 31.

Portable apparatus for generating gas from oil. C. T. MCELVANEY and E. F. LEE. U. S. 1,600,639, Sept. 21.

Removing hydrogen sulfide from gases. W. GLUUD. U. S. 1,597,964, Aug. 31. Gas is treated with a soln. of NH_3 and Ni NH_4 sulfate or other Ni salt and the resulting sulfide is subjected to the action of air or other gas contg. O to effect regeneration.

Removing hydrogen sulfide from gases. T. P. L. PETIT. U. S. 1,598,985, Sept. 7. Gas is washed with an alkali metal carbonate soln. to remove H_2S; a gas contg. CO_2 is passed through the resulting soln. to expel the absorbed H_2S; the soln. thus obtained is heated to regenerate the alkali carbonate soln. by decompg. bicarbonate and the liberated CO_2 is used to treat additional washing soln.

Removing hydrogen sulfide from gases. KOPPERS CO. Brit. 241,248, June 10, 1924. In a process such as that of Brit. 240,891 (*C. A.* **20**, 2578), a freshly pptd. Fe compd. such as $Fe(OH)_2$ or $Fe(OH)_3$ is used for treating the air to which the H_2S from the gas has been transferred. An app. is described.

Purifying gases. KOPPERS CO. Brit. 241,452, June 10, 1924. Spent liquids contg. a sulfide in suspension which have been used for gas purification and H_2S removal as described in Brit. 241,248 (*supra*) are revivified by treatment with min. air bubbles which may be passed into the liquid through finely porous material such as "filtros," alundum or earthenware. S rising to the surface may be skimmed off. Cf. *C. A.* **20**, 2578.

Enriched water gas. W. E. TRENT. U. S. 1,600,375, Sept. 21. **Streams of air**

and steam are alternately passed through a bed of ignited carbonaceous fuel in a generator during a plurality of successive blow and gas-making periods, the steam being decomposed in the gas-making periods. During each gas-making period there is introduced into the generator a fuel such as material contg. comminuted coal, oil and H_2O of plastic consistency and in ribbon-like form. The volatiles from this fuel are vaporized and mixed with the water gas and serve to enrich the latter.

Removing phenols from waste waters, etc. P. PREISS. Brit. 241,682, Sept. 19, 1924. PhOH and its homologs are removed from waste waters, etc. by solvents in vapor form, *e. g.*, by C_6H_6, benzine or C_2HCl_3 applied countercurrentwise in a scrubbing tower.

Semi-coke. KOHLENSCHEIDUNGS-GES. Brit. 241,262, July 11, 1924. Solid products obtained by low-temp. distn. of fuels are subjected to wet or dry treatment to remove ash-forming constituents and the purified dust may be formed into fuel briquets, lamp carbons or other electrodes, or may be mixed with liquid hydrocarbons to produce a stable liquid fuel.

Apparatus for utilization of heat from coke, slags, ashes, etc. for steam production. P. BRINGHENTI. U. S. 1,597,718, Aug. 31.

22—PETROLEUM, LUBRICANTS, ASPHALT AND WOOD PRODUCTS

F. M. ROGERS

The search for oil in Australia. A. WADE. *J. Inst. Petroleum Tech.* **12,** 145–64, 164–72(1926). M. B. HART

Mining for lost oil. LEO RANNEY. *Petroleum World* **11,** No. 6, 42, 76–7(1926).—A description of the Ranney process of mining oil. M. B. HART

Separation of the components of petroleum. Bromination of Persian petroleum fraction, boiling 60–80°. P. F. GORDON, D. BAIRD AND T. G. HUNTER. *J. Roy. Tech. Coll. Glasgow* No. **2,** 53–63(1925).—When the fraction of Persian petroleum boiling between 60° and 80° is treated with Br, drop by drop, in the presence of an excess of Fe at 16° smooth bromination occurs without any side reactions. The product is a plastic mass, the bulk of which dissolves in ether, leaving a white cryst. residue. After distn. of the ether soln. the residual liquid seps. into 2 immiscible layers, and a small quantity of a white cryst. substance (m. 164°) is pptd. The heavy liquid has the empirical formula $C_5H_7Br_3$ and the lighter liquid the formula $C_6H_{11}Br_4$ Both liquids are viscous and have a tendency to decompose with evolution of HBr. The ether-insol. crystals can be fractionated from ethylene dichloride into 5 cryst. products having the following m. ps. in order of increasing soly.: 293.5°, 273 5°, 299.8°, 283° and 305°. The second and third have the empirical formulas $C_7H_6Br_4$ and $C_5H_4Br_4$, resp. All 5 compds. are sol. in CS_2 and in acetone and are not decompd. by an alc. soln. of KOH. The first bromide, on shaking with benzoyl chloride and pouring the product into water contg. a little Na_2CO_3, gives a white cryst. ppt., sol. in water, alc. and ether. After recrystn. from alc. it m. 120°. B. C. A.

Analyses of Panhandle crude oil. C. K. FRANCIS. *Oil & Gas J.* **25,** No. 11, 24, 124(1926).—Analyses of 14 samples of Panhandle crude oil by dry distn. and of 2 samples by steam distn. indicate that the gasoline content is from 60 to 65%, with topping and cracking. Cracking stock, gas oil and lubricating distillate equal 30–46%. M. B. HART

The cracking industry in America. SEDLACZEK. *Teer* **24,** 353–6(1926).—The various processes in com. use are briefly described. W. B. PLUMMER

Results of topping and cracking Panhandle crude. GUSTAV EGLOFF AND J. C. MORRELL. *Natl. Petroleum News* **18,** No. 31, 43–4(1926).—Tests were run on Panhandle crude and topped crude oil for the purpose of detg. the relative gasoline yields. A non-residual oil-cracking test on the crude oil gave 70% Navy end-point gasoline On a residual oil basis the gasoline yield was 63% based on the crude. The cracking of the topped crude oil on a residual oil basis showed a gasoline yield of 65%. When Navy fuel oil was produced, the gasoline yield was 55%. Analysis of the crude oil, distn. analyses of the crude oil, and of the products from all tests are given. M. B. H.

Removal of sulfur from Panhandle crude oil. V. B. GUTHRIE. *Natl. Petroleum News* **18,** No. 29, 17–8(1926).—The refining of Panhandle crude oil to yield 4 streams, export gasoline, blending naphtha, distillate and gas oil is described. The export gasoline is treated in a continuous process with caustic soda followed by the addition of litharge. M. B. HART

Stellarene cracking process in operation at Baltimore refinery. P. TRUSEDELL. *Natl. Petroleum News* **18**, No. 25, 104(1926).—A description of the cracking unit producing Stellarene at the Interocean Oil Co., Baltimore. M. B. HART

Automatic cracking unit operation. C. O. WILLSON. *Oil & Gas J.* **25**, No. 5, 130–1(1926).—Exclusive features claimed for the Jenkins cracking process include: The continued circulation of stock until it is at the desired temp.; high-quality recycle stock; the elimination of corrosion troubles by means of a lime treatment; the formation of a small amt. of fixed gases. M. B. HART

New Dubbs installation. J C. CHATFIELD. *Natl. Petroleum News* **18**, No. 30, 48–50(1926).—The new Dubbs installation at the Marland Refg. Co. refinery, Ponca City, Okla. is described. M. B. HART

Acid-resisting coatings for wood surfacing. H. L. KAUFFMAN. *Refiner & Natural Gasoline Mfr.* **5**, No. 7, 24(1926).—The proper paint protects metal surfaces from corrosive fumes about a refinery from weathering, and also reduces evapn. to a min. The results obtained from tests on 15 coatings are given M. B. HART

Contact filtration literature listed for ready reference. C. K. FRANCIS. *Oil & Gas J.* **25**, No. 2, 156–7(1926).—An extensive bibliography N. B. HART

Resinification of paraffin oils. S. VON PILAT AND J. DUKIET. *Erdol und Teer* **2**, 571(1926).—Boryslaw (Galicia) paraffin oils on standing sep a small quantity of resinous matter which on successive extns. with C_6H_6, $CHCl_3$ and pyridine gave, resp., 19–36%, 15–22%, 29–35%, residue 18–22%. The S content of all 3 sol. fractions was about 2.5%, whereas the crude oil contains only 0 1%, this indicating clearly the origin of the resinous matter. W. B. PLUMMER

Possible use of naphthenic and aromatic hydrocarbons in California crude petroleums. JOHN PERL. *Oil Age* **23**, No. 8, 22–4(1926) —The conversion of naphthenes from crude petroleum into benzene and toluene and other aromatic hydrocarbons may be accomplished by pyrolytic decompn. or by catalytic or chem dehydrogenation. Preliminary cracking is to be avoided because the 5-ring cyclic compds. are largely formed thereby, which cannot be converted to the benzene ring M B. HART

Some notes on Kimmeridge shale oil. J. S. REMINGTON. *Ind. Chemist* **2**, 150–2 (1926).—The general characteristics and possible origin of oil shale are discussed and some expts. on the retorting of Kimmeridge shale are described and the results given. E. G. R. ARDAGH

Sulfur compounds in Kimmeridge shale oil. FREDERICK CHALLENGER, JOHN HASLAM AND R. J. BRAMHALL. *J. Inst. Petroleum Tech* **12**, 106–34(1926); cf. *C. A.* **20**, 3231.—The portion of Kimmeridge shale oil which was volatile in steam was freed of amines, phenols and ketones by successive treatment with HCl(1 .3), NaOH(10%) and satd. $NaHSO_3$. The product was dried and distd to 180° and the distillate fractionated at atm. pressure. The product above 180° was fractionated at 27 mm. The following fractions were obtained: (1) —93°, (2) 109 117°, (3) 117–126°, (4) 132–140°, (5) 158–167°, (6) 110–115°/27 mm., (7) 115–140°/27 mm. In each fract thiophene or its derivs. were obtained. A list of 101 references is given. M. B. HART

Determination of aromatic hydrocarbons in gasoline. G. MÜHLE AND K. R. DIETRICH. *Erdol und Teer* **2**, 572(1926).—A discussion of previous work along the lines proposed by Riesenfeld and Bandte (*C. A.* **20**, 3346). W. B. PLUMMER

Reports on the progress of naphthology during 1924. *J. Inst. Petroleum Tech.* **11**, 329(1925).—The following reports are given: **Light distillates.** S. T CARD. *Ibid* 329–32. **Heavy distillates.** HAROLD MOORE. *Ibid* 332–6. **Lubricants, lubrication and insulating oils.** R. W. L. CLARK. *Ibid* 337–42. **Special products.** F. G. P. REMFRY. *Ibid* 343–6. **Ultramicroscopical research on asphalt.** F J. NELLENSTEYN. *Ibid* 346–8. **Natural gas.** S. J. M. AULD. *Ibid* 348 50. **Chemistry.** F. B. THOLE. *Ibid* 350–6. **Analysis and testing of petroleum.** S. BOWMAN. *Ibid* 357–61. **Cracking.** R. PITKETHLY AND A. E. DUNSTAN. *Ibid* 361–9. **The hydrogenation of coal.** H. G. SHATWELL. *Ibid* 369–74. **Berginization of Emma coal.** H. I. WATERMAN AND J. N. J. PERQUIN. *Ibid* 374–8. **Refining.** A. W. NASH. *Ibid* 378–85. **Petroleum geology.** J. E. M. HALL. *Ibid* 385–91. **Geophysical methods.** W. R. MACDONALD. *Ibid* 391–2. **Drilling methods and tools.** ASHLEY CARTER. *Ibid* 392–5. **Oil engineering.** A. W. NASH. *Ibid* 395–400. M. B. HART

Close fractionation necessary to get gasoline yield. J. C. CHATFIELD. *Natl. Petroleum News* **18**, No. 25, 99–101(1926).—In stripping lean gas of its gasoline content in the Monroe Field, well pressure of 150 lbs. per sq. in. is used for the circulation of gas which is run direct to the absorbers. M. B. HART

Gasoline from Hurdle District oil. P. WAGNER. *Natl. Petroleum News* **18**, No. 31, 70–1(1926).—A distn. test on Hurdle District (Texas) crude oil of 28.2° A. P. I.

gravity gives benzine (gravity 55.0 initial b. p. 140° F., end point 434° F.) 18.7%; kerosene (gravity 41.0, flash 152° F., fire 172° F.) 6.7%; gas oil (gravity 35.0, flash 190° F., fire 225° F.) 16.7%; wax distillate 10.5%; bottoms 46.8%; loss 0.6%. Results of Hemple and Engler distns. are given. M. B. HART

Storage of gasoline under pressure. J. A. BRITTON, JR AND R. H. BRINTON. *Natl. Petroleum News* **18**, No. 29, 24–7(1926).—Gasoline storage tanks maintained under about 13 inches of H_2O pressure showed an av. evapn. loss of 0 21% for the year as compared with the usual 2% loss for tanks maintained at atm. pressure. In tanks equipped with insulated roofs, the loss was 0.177%. M. B. HART

Testing the properties of gasoline. A. P. BJERREGAARD. *Oil & Gas J.* **25**, No. 32, 187(1926).—Items suggested to be included in the specifications for a motor gasoline of good quality are volatility for winter, initial b. p. between 90° and 115° F.; for summer initial b. p between 100° and 120° F.; end point not above 437° F., 20% not above 206° F., 50% not above 306° F, 90% not above 420° F. The gasoline should be noncorrosive to the Cu-strip test. Unsaturates by Bott's method should be not less than 10%. Constituents forming gum in the dark should be absent. Total S should not be over 0.1%. All reference to gravity, color, odor, doctor test and light-stability should be omitted. M. B. HART

Carbon deposit and gasoline quality. S. P. MARLEY, C. J. LIVINGSTON AND W. A. GRUSE. *J. Soc. Automotive Eng.* **18**, 607–12(1926).—High operating temp., the use of the more volatile fuels and a lean air-fuel mixt., and the use of lubricating oils of relatively high volatility which contain little C residue all tend to reduce the deposition of C in an internal-combustion engine. The test engine, control app. and test procedure are described. M. B. HART

Terminating charcoal tests of gas. F. L. KALLAM. *Oil & Gas J.* **25**, No. 8, 120–1 (1926).—A standardized method for detg. the max. test point when testing gas for its gasoline content by passing it through active charcoal is described. Also in *Mech. Eng.* **48**, 1030(1926). M. B. HART

Fundamentals of heat exchanger design as applied to natural gas plants. A. F. SEMINO AND F. L. KALLAM *Oil Age* **23**, No. 7, 35–8(1926).—Since the heat transfer takes place between two oils through a metal surface, it is necessary to consider the characteristics of the two liquids as well as the surface arrangement in the design of a heat exchanger. Present fuel costs do not warrant a recovery of more than 75% of the available heat. M. B. HART

The combustion of fuel oil. WALTER KEMP, JR. *Oil Eng. Tech.* **7**, 303–8(1926).—The products of combustion, combustion chart, fuel loss, volumetric % of CO_2 at various funnel temps , and the humidity table of a fuel oil having the following compn. are given: C 84.0, H 11.0, O 1.0, N 1 0%, and H_2O 0.50%. Methods of calcn. are given. M. B. HART

Testing methods for absorbers. L. O. WARNER. *Petroleum World* **11**, 50–1, 110 (1926).—Comparative tests show that, whereas the same operator can obtain results which check within 5–10%, two operators rarely check within 15–50%. Errors may be due to imperfect temp. control. Distn. with glycerol introduces an error because of its tendency to decompose at low temps. to produce compds. having acid reaction, which increase the vol. of gasoline. M. B. HART

Cutting oils made from mineral and fatty oils preferable. H. L. KAUFFMAN. *Oil Trade* **17**, No. 6, 51–2, 74(1926).—A compounded cutting oil contg. 5–50% fatty oil is preferable for use over either a fatty oil or a mineral oil used alone. Specifications for various grades of cutting oil are given. M. B. HART

Reclamation of lubricating oil. Tulsa Library Bibliography—Technical Dept.—Tulsa Public Library. *Oil & Gas J.* **25**, No. 9, 36, 100(1926).—A list of 64 references. M. B. HART

Some deleterious properties of lubricating oils. J. E. HACKFORD. *Oil Eng. Tech.* **7**, 325–7(1926).—The usual type of analysis to which a lubricating oil is submitted does not indicate the inherent acidity of the oil or the subsequent acid formation, which are among the deleterious features that develop in the oil on use. A test is described by means of which the rate of acidity formation may be followed. A 50-cc. distn. flask fitted with a drawn-out tube is placed in an air bath at 150° and O is bubbled through at the rate of 1 bubble per sec. for 9 hrs. The contents of the flask are then titrated. Hackford's factor (rate of acidity formation) is the difference between the total acidity (in cc. 0.1 *N* KOH per 10 g. oil treated) and the inherent acidity as detd. above. A method for detg. the acidity of an oil which will cause damage to bearings consists in extg. 50 cc. of oil with boiling distd. H_2O for 1 hr., filtering and pouring to a definite mark in a 50-cc. U tube, and measuring the deflections on a

millivoltmeter obtained when connection is established between a Cu and a Zn foil placed in each leg of the tube M. B. HART

Clay-pulp method of filtering lubricating oils. H. L. KAUFFMAN. *Oil Trade* **17**, No. 8, 15–6(1926).—The essential feature of the clay-pulp process of filtering lubricating oils consists in the formation of a stable clay-oil emulsion of wet clay pulp and acid oil in a 50–50 ratio, which is admixed with the main batch of oil in a heating element such as a pipe still. It is then moved to a vapor or oil separator where the light vapors are steamed off and the clay is filtered off in a filter press. M. B. HART

Oil wells near Sand Springs yield brine (CHATFIELD) **18.** Explosibility of oil-shale dust (ALLISON, BAUER) **24.** Calculation of the viscosity of mixtures of petroleum and creosote (BATEMAN, BAECHLER) **20.** Adsorptive agent for purifying oils (U. S. pat. 1,598,256) **18.** Revivifying spent filtering materials (U. S. pat. 1,598,967) **18.**

VAN PATTEN, NATHAN AND LEWIS, GRACE S.: **Selective Bibliography of the Literature of Lubrication.** Queen's University, Kingston, Canada: Nathan Van Patten. 166 pp. $5.00.

Emulsion for the purification of oils. P. W. PRUTZMAN and P. D. BARTON. U. S. 1,599,715, Sept. 14. In forming a stable emulsion of mineral lubricating oil or a similar oil and Florida fuller's earth or other wet adsorbent material, the oil and other material are mixed to form an oil-continuous emulsion, and this emulsion is then treated with steam and agitated until the phases reverse with production of a stable H_2O-continuous emulsion.

Dehydrating petroleum oil. H. O. BALLARD U. S. 1,600,030, Sept 14. The oil is heated and passed in a continuous stream through a closed chamber and emulsion is removed from the bottom of the stream as it settles by gravity.

Treating petroleum sludge. I HECHENBLEIKNER and T. C OLIVER. U. S. 1,599,360, Sept. 7. Petroleum sludge is sepd. into its hydrocarbon and acid constituents by subjecting a mixt of the sludge with H_2O to the action of an internal heat treatment under about 6 atm pressure and at high temp. (which may be about 180°). An app. is specified having an exterior acid-proof lining such as Pb with an interior refractory facing, *e. g*, masonry. Cf. *C. A*. **20**, 2410.

Low-boiling products from petroleum oils. J. H. JAMES. U. S. 1,597,796, Aug 31. Artificially introduced and chemically combined O is assocd. with oils such as those of petroleum by the action of air and a catalyst and the product is then thermally decompd. to produce lighter products U. S. 1,597,797 specifies partial oxidation of heavier mineral hydrocarbons by mixing heavier and lighter oil fractions, vaporizing the mixt., mixing it with O and passing the mixt. in vapor form through a reaction zone maintained at a temp such as to effect partial oxidation (usually about 230–450°). U. S. 1,597,798 specifies a process similar to that of U. S 1,597,796 except that fresh hydrocarbon oil is added to the partially oxidized mixt before it is thermally decomposed.

Bubble tray for petroleum oil condensing columns, etc. F. E. GILMORE. U. S 1,598,772, Sept. 7. The app. is adapted for absorbing gasoline vapors from casinghead gas.

Cracking hydrocarbon oils. E. C. HERTHEL and H. L. PELZER. Brit. 241,866, Oct. 24, 1924. Oil undergoing cracking by heat and pressure as described in Brit. 232,178 (*C. A* **19**, 3585) is filtered through asbestos, sil-o-cel, disintegrated firebrick, sand, pumice, Fe shavings, glass or mineral wool, kieselguhr, Fe ore or oxide, calcined bauxite, petroleum coke, charcoal or similar materials.

Cracking hydrocarbon oils. E. C. HERTHEL. U. S. 1,598,136, Aug. 31. A body of oil to be cracked is subjected to distn. under superatm. pressure and at a cracking temp. which is maintained during the main portion of the run and vaporization is effected under substantially undiminished pressure Fresh stock is fed in during a portion of the run in sufficient quantity to prevent the pitch formed by the cracking process exceeding the satn. point in the oil undergoing distn. and, during a further portion of the run, feeding is continued and pitch-laden oil is drawn off in such proportioned quantities as still to maintain the pitch below the satn. point.

Distilling and cracking hydrocarbon oils. H. L. DOHERTY. U. S. 1,597,674, Aug. 31. Oil under pressure is circulated through a heater, vapors are sepd. from the heated oil, and the vapors and oil are passed through a cracking chamber while under pressure in counter-current paths. Residual oil from the cracking chamber is passed to an evaporator where it is distd. by reducing the oil pressure, the residue vapors are con-

densed by heat interchange with untreated oil and residue oil from the evaporator is returned to the cracking chamber. Vapors from the cracking chamber are condensed. An app. is described.

Cracking hydrocarbon oils. C. P. DUBBS. U. S. 1,600,721, Sept. 21. Small streams of oil are continually passed through vertical tubes in a furnace in which the oil is heated to cracking temp. The oil is thence passed to an expansion chamber where substantial vaporization occurs and from which no unvaporized oil returns to the heating streams. Vapors from the expansion chamber pass to a dephlegmator to which raw oil also is supplied which contacts with the vapors. Vapors from the dephlegmator are led to a condenser and reflux condensate and raw oil from the dephlegmator are passed to the lower ends of the heating tubes. The operation is carried out under pressure. Cf. *C. A.* **20,** No. 3235.

Distilling and hydrogenating hydrocarbon oils. G. KOLSKY. U. S. 1,598,973, Sept. 7. Crude oils, heavy residues, etc. are treated with NH_4Cl or other NH_4 salt in the presence of a finely divided metal such as Fe which will react to evolve H and free NH_3 at a temp. of 150–425° and low b. p. hydrocarbons thus formed are withdrawn The pressure of the evolved vapors is controlled in order to control the activity of the reaction.

Apparatus for cracking hydrocarbon oils. D. PYZEL. U. S. 1,597,821, Aug. 31.

Apparatus for heat-treatment of hydrocarbon oils with molten metals. D. RIDER and J. S. WATTS. U. S. 1,600,139, Sept. 14.

Apparatus for vacuum distillation of hydrocarbon oils. W. K LEWIS. U. S. 1,599,824–5, Sept. 14.

Apparatus for cracking oil. C. M. PAGE. U. S. 1,598,618, Sept. 7. Heating devices are positioned in the vapor space of a cylindrical still.

Heating coil, expansion chamber and auxiliary apparatus for cracking oils. G. EGLOFF and H. P. BENNER. U. S. 1,598,368, Aug. 31.

Vertical still and associated apparatus for cracking oils. L. B. CUDDY. U. S. 1,598,805, Sept. 7.

Oil-treating composition. H. REINBOLD. U. S. 1,600,845, Sept. 21. A colloidal Na silicoaluminate mixed with NaOCl is used for desulfurizing, bleaching and filtering hydrocarbon or other oils.

Mineral oil distillation. A. E. PEW, JR. and H. THOMAS. Can. 258,425, Feb. 23, 1926. A body of liquid Hg is vaporized and a stream of oil is flowed continuously in and out of a confined space and distributed over a large superficial area; a regulated flow of Hg vapor is flowed into heat exchange relation, but out of contact with the oil in the space, in such vol , and at a pressure corresponding to a temp. of condensation so substantially above the temp. of the oil, as to effect the vaporization of a predetd. fractional part of the oil. The oil vapors are condensed and the Hg condensate is returned to the body of liquid Hg.

Oil clarification. C. VAN BRUNT Can. 262,397, July 6, 1926. A preliminary step in the process of removing suspended solid matter from oil by the action of an aq. water-glass soln. consists in dissolving a Mn resinate in the oil

Recovering light oils from heavy oils. A. OBERLE. U. S. 1,599,429, Sept. 14. Volatile material is distd from heavy oils such as tarry residual products, the evolved vapors are passed through an absorbent activated petroleum C, and the treated vapors are condensed and collected as distillate.

Non-saponifiable oil and wax compound. E. A. NILL. Can. 257,666, Jan. 26, 1926. A compn. which includes a neutral anilide and a mineral oil substance.

Gasoline by pressure distillation. F. M. ROGERS and M. G. PAULUS. U. S. 1,599,100, Sept. 7. Fuel oil or other similar hydrocarbon oils of high b. p. are subjected to pyrogenetic distn. and the gasoline-contg. distillate is condensed in a condenser in communication with the still and also under pressure. The liquid distillate is isolated and the gas dissolved in the distillate is permitted to pass out of the distillate while under pressure and then released with a gradual reduction of pressure.

Device for testing the flash point of oils. C. E. EMMONS. U. S. 1,600,406, Sept. 21.

Breaking oil-water emulsions. J. C. WALKER. U. S. 1,597,700, Aug. 31. Petroleum emulsions are treated with CH_2O and steam to effect sepn. of the H_2O.

Furnace and associated pipe coil still for refining petroleum oils. F. C. MOORE and P. VANDERVORT. U. S. 1,599,833, Sept. 14.

Oil-purifying apparatus for hydrocarbon engines. J. A. WATSON. U. S. 1,591,690, July, 6.

Recovering values from oil shale. M. J. TRUMBLE. U. S. 1,598,831, Sept. 7.

Superheated steam is partially decompd. to form H and oil shale is heated with the steam and H and vapors formed are withdrawn and condensed.

Retort for treating oil shale. E. B. ROTH. U. S. 1,598,882, Sept. 7.

Superposed rotatable retorts for carbonizing shale, etc. E. G. STONE. Brit. 241,382, Oct. 16, 1924.

Lubricant. T. S. HAMILTON. U. S. 1,599,963, Sept. 14. Graphite is mixed with about 6 times its quantity of a cellulose ester, *e. g.*, a nitrocellulose compn., to form a lubricant stuitable for use on leaf springs, etc

Lubricant. M. C. VANGUNDY and J. R. SCANLIN. U. S. 1,599,854, Sept. 14. About equal quantities of cylinder stock and a soda soap are used together for lubricating locomotive journal bearings, etc

Lubricant and rust preventative. A. DOKTER. Brit. 241,678, Sept. 13, 1924. A mixt. of zinc white 7.5, lampblack 4 5, graphite 33, horse-fat 7.5, seal oil 18 and consistent grease 7.5 parts (the grease being such as is obtained by stirring solid tallow with a Ca or Al soap).

Solid lubricant. L. A. WALKER. U. S. 1,598,225, Aug. 31. A lubricant suitable for use on locomotive driving journals is formed of paraffin base cylinder stock 52, Na stearate 46 5, free alkali 0 5 and H_2O 1%

Lubricating bearing surfaces with a film of mercury. C. F. SHERWOOD. U S. 1,598,321, Aug 31.

Removing asphalt from asphalt base oils. E. O. LINTON. U. S. 1,599,777, Sept. 14. Asphalt base oil is continuously delivered on to a heated surface within an externally heated still, maintained at a temp. sufficient to volatilize substantially all the oils of high b. p. but not high enough to vaporize asphaltic ingredients. Residual liquid oil and vapors flow into an open still chamber, within which the temp. is maintained at about 445–460°, in which the residual oil flows continuously over the heated wall of the still, so that vaporizable constituents are freely liberated into the still spaces Asphaltic residuum is removed from the bottom of the still, and resulting vapors are all permitted to pass out together to a condenser.

Asphaltic residues from petroleum. S. W. MOSS. U. S. 1,599,369, Sept. 7; Can 259,179 Mar. 23, 1926. Petroleum is heated to a distg. temp. in 2 stages between which it is centrifuged to eliminate most of the insol. impurities. The temp. of the 2nd stage is maintained until an asphaltic residue is left, so that deposition of salt and other impurities in the high temp. still is minimized and an asphaltic deriv. is produced which contains substantially less than 2% of insol. substances.

Bituminous emulsion. F. LEVY. Can. 262,783, July 20, 1926. An aq. bituminous emulsion is produced by mixing together molten bituminous material, a proportion up to about 10% of an emulsifying agent comprising tannic acid, and a dil aq soln. of alkali

Impregnation material. C. HÖRDYE. Can. 260,711, May 11, 1926. An impregnation material comprises a substance obtained by heating a mixt. of unsatd. oils, S and a bitumen produced from oils with an asphalt basis.

Removing tar from pyroligneous vapors of wood distillation. E. A. BARBET U. S. 1,598,547, Aug. 31. Vapors from wood distn. retorts are passed in countercurrent flow in contact with a condensate from the vapors, uncondensed vapors are removed and partially condensed to remove substantially all the tar from them and this condensate is added to the first condensate.

Steam-distilled wood turpentine. D. L. SHERK. U. S. 1,600,143, Sept. 14. Steam-distd. wood turpentine is contacted for a prolonged time (which may be about 1–2 hrs. at 100–115°) with an alkali such as a 20% aq. or alc. NaOH soln. until resinification of the readily polymerizable constituents has been effected, and the treated turpentine is then distd. to obtain a product largely freed from the irritating effect of the original turpentine.

Gravity separation of turpentine from aqueous liquid. J. W. BUCHANAN. U. S. 1,599,163, Sept. 7.

Sawdust-distilling apparatus. W. LEE. U. S. 1,598,290, Aug. 31.

23—CELLULOSE AND PAPER

CARLETON E. CURRAN

Guignet-cellulose from lignocellulose and wood. C. G. SCHWALBE AND W. LANGE. *Z. angew. Chem.* **39**, 606–8(1926).—Methods of prepg. Guignet-cellulose from lignocellulose and pine wood are given. Its properties are described and compared with those of other celluloses.

R. C. ROBERTS

The formation of alkali-cellulose compounds when the medium is a mixture of water and alcohol (instead of water alone). J. R. Katz. *Z. Elektrochem.* **32,** 125–8 (1926).—K. points out that by treating cellulose fibers with increasing concns. of NaOH (up to 16%) the cellulose spectrum persists with that of the alkali cellulose. Thus at a definite NaOH concn. a definite no. of cellulose crystallites, which have been converted into alkali cellulose, are in equil. with the unchanged crystallites remaining. The state of homogeneous equil. can be detd. by means of Röntgen spectrographic methods. Regarding the reaction of cellulose and aq.-alc. NaOH, K. points out, by means of Röntgen spectrographic studies, that even in the presence of 10 to 35% alc. cotton cellulose gives the same compd. with 15–16% alkali as in pure aq. soln., which is contrary to the view of Vieweg and Hess (*C. A.* **19,** 1050). The cellulose diagram always disappears at 16–17% NaOH concn. The high absorption of NaOH by cellulose from aq.-alc. solns. has not been explained. The assumption of a stable soln. also meets with difficulties. Louis E. Fleck

Interesting facts about cellulose acetate. A. J. Hall. *Dyer & Calico Printer* **56,** 46–7(1926).—The prepn. and properties of cellulose acetate are discussed. Chas. E. Mullin

Properties and analysis of cellulose acetates. M. Deschiens. *Rev. gén. mat. plastiques* **2,** 291–6, 361–7, 411–21(1926).—Review. A. Papineau-Couture

Cellulose acetate and its commercial utilization. M. Deschiens. *Rev. prod chim.* **29,** 5–8, 37–42, 73–7, 109–13, 151–3(1926).—A review of the manuf. and properties of cellulose acetates and present com. uses. A. Papineau-Couture

Protection of celluloid against fire. A. Helle-Staux. *Rev. gén. mat. plastiques* **2,** 241–3, 312–4(1926).—Discussion of the mechanism of decompn. and combustion of celluloid and methods of preventing or retarding combustion. A. P.-C.

The action of heat on cellulose. J. Watson Bain. *Pulp Paper Mag. Can.* **24,** 783(1926).—See *C. A.* **20,** 2411. A. Papineau-Couture

Researches on wood pulp. III. A few properties of purified wood pulp. Takeshi Ozawa. *J. Soc. Chem. Ind.* (Japan) **29,** 78–84(1926); cf. *C. A.* **19,** 894.—O. has examd. a few properties of bleached sulfite wood pulp (I) by comparison with a pulp (II) purified with lime and Na_2SO_3 (*Ibid* **28,** 285(1925)). On heating to 95–100° for 22–84 hrs., or storing for 47 days in air, I gradually becomes yellowish brown and its Cu no. increases while the α-cellulose content decreases. Similar changes do not occur so rapidly in II. There are many differences between the viscose made from the 2 pulps. Viscose from II resembles that from cotton cellulose as regards changes occurring during aging and in the properties of the cellulose regenerated. The Cu number of the regenerated cellulose increases with the length of the aging period, whereas the ease of hydrolysis and the viscosity decrease. The rate of increase of the Cu no. of I is greater than II, this and other differences being due to the presence of the degraded cellulose in the unpurified pulp. K. Kashima

The strength determination of pulp. F. Rühlemann. *Papier-fabr.* **24,** Tech.-Wiss. Teil, 1–6(1926); *Zellstoff u. Papier* **6,** 24–6(1926).—The use of an elaborate app., with or without a motion-picture camera, for ascertaining the tensile strength of individual fibers is described. By this app. it is shown that the strength properties of a Mitscherlich sulfite pulp, bleached in the usual manner at 35°, at first increases and then decreases as the bleaching progresses. J. L. Parsons

The effect of catalysts in the manufacture of sulfite pulp. L. F. Goodwin and W. H. Birchard. *Paper Ind.* **8,** 617–20(1926).—A Pb-lined, gas-heated, revolving autoclave was developed for cooking sulfite pulp, and a series of cooks was run under standard conditions, with chemicals which might have a positive catalytic effect on the sulfonation or hydrolysis of lignin and a possible negative catalytic effect on the destruction of cellulose. PhOH retarded the penetration of the chips by the liquor and the action of the acid on the chips. Phenolsulfonic acid gave similar results, except that the stock was not so pink, indicating that some PhOH had been deposited on the fibers in the PhOH cooks. Addn. of $CaCl_2$ and of NH_4Cl slowed the cooks, $CaCl_2$ increasing and NH_4Cl reducing the strength of the stock. Addn. of MeCOEt and of AcOH resulted in incomplete disintegration of the wood because of the reaction of the added chemicals with the cooking acid. A. Papineau-Couture

Comparison of methods used for testing sulfite cooking acid. W. H. Birchard. *Paper Ind.* **8,** 793–6(1926).—From a discussion and comparison of the Winkler (titration with standard I and with standard NaOH on sep. portions of sample), Hohn (successive titrations with I and with NaOH on the same portion of sample), Sander (titration with NaOH, followed by addn. of satd. $HgCl_2$ soln. and a second titration with NaOH, with Me orange indicator in both cases) and iodate (titration with I,

followed by addn. of an excess of KIO_3 and titration with $Na_2S_2O_3$) methods for detg. total and combined SO_2, both in the fresh cooking liquor and in the liquor during the whole course of the digestion, B. concludes that the iodate method gives the most reliable results and is as easily done as any of the others. A. PAPINEAU-COUTURE

Control of the manufacture of bleach liquors. L. RYS. *Paper Trade J.* **83,** No. 8, 51-2(1926).—Votoceck's method for the detn. of chlorides (*C. A.* **12,** 2177) has been adapted to the detn. of chlorates in bleach liquor, and comparison with Lunge's method (detn. of chlorate plus hypochlorite by addn of $FeSO_4$ and titration of the excess with $KMnO_4$ and detn. of hypochlorite alone with $Na_2S_2O_3$ or As_2O_3) showed the 2 methods to give practically identical results. The following technic is recommended: dil. the sample to 100 cc., add 5 cc of 10% $NaNO_2$ and 10 cc. concd. HNO_3, let stand 1 hr., add 1 cc H_2O_2 soln., let stand 15 min , dil. to 175 cc., and titrate with 0.1 *N* $HgCl_2$ in the presence of 6 drops of Na nitroprusside (6 g. of the salt dissolved in 30 cc. H_2O and 10 drops concd HNO_3), giving total Cl as chloride. Hypochlorite Cl is detd. separately as follows: dil. to 175 cc., oxidize the hypochlorite with H_2O_2, acidify with HNO_3, and titrate with $HgCl_2$. A. PAPINEAU-COUTURE

Constitution of spruce lignin. PETER KLASON. *Pulp Paper Mag. Can.* **24,** 965 7(1926).—See *C. A.* **20,** 1516. A. PAPINEAU-COUTURE

The fatty acids in pine oil obtained as a by-product in the manufacture of sulfate pulp. TORSTEN HASSELSTROEM *Pappers- och Travarutidskrift for Finland* **1295,** No. 25, 632-8; *Paper Trade J* **83,** No 2, 60-4(1926).—Investigation of the fatty acids in refined pine oil obtained as a by-product in sulfate mills showed that it contains principally oleic acid, some palmitic acid, a little linolenic acid, a small quantity of an unidentified unsatd acid, traces of a solid acid (possibly identical with the high mol lactone acid of Sandqvist), and possibly also a small quantity of linoleic acid. The technic and results are described in detail A. PAPINEAU-COUTURE

Nordstrom chip-drying tower. ANON. *Paper Trade J.* **83,** No. 5, 53-4(1926).—Tests on the newly installed Nordstrom tower at the Crown Willamette sulfate mill at Camas, Wash., showed that the chips can be dried from 50% down to 2 3% H_2O content, all the entrained chemicals carried by the flue gases from the recovery plant are held by the chips, the gases are practically completely deodorized, and the digester is more rapidly filled with the dry than with the wet chips and holds more dry wood per cu. ft of digester space with dry chips (nearly 12.5 lbs.) than with wet chips (9.8 lbs), which is attributable partly to the smoothness of the chips and partly to shrinkage on drying below 20% H_2O content. A. PAPINEAU-COUTURE

Sabai grass (as a paper-making material). TEKUMALLA VENKAJEE. *Paper Trade J.* **82,** No. 22, 54(1926)—The av. cellulose content on the dry basis is 48%, of which 80% is α-cellulose. Lab. cooks for 1 hr. at 60 lbs. and then for 2 hrs. at 40 lbs (making a total of 3 hrs) with 15% of NaOH at a concn. of 6% gave a yield of 40.6% of unbleached pulp with a consumption of 10.5% NaOH. With 5% of bleach it gave 37% of "full white" pulp With Raitt's system of digestion the yield of bleached pulp is practically the same, the bleach consumption is reduced to about 2.5%, and the color is "brilliant white." Sabai grass compares very well with esparto as a paper-making material. A PAPINEAU-COUTURE

The biological purification of unfermented and fermented sulfite liquors (MÜLLER, MÜLLER) 14. Chemistry of lignin (RUŠNEV) 10. The peptization of pyroxylin (BYRON) 2.

Cellulose. KOLN-ROTTWEIL AKT.-GES. AND E. OPFERMANN. Brit. 241,536, Oct. 17, 1924 Cellulose of low viscosity characteristics is prepd. without adversely affecting its chem. properties by treatment with small quantities of alk. substances such as NaOH, alk earth hydroxides, $Mg(OH)_2$, carbonates, bicarbonates, water glass and NaOAc together with oxidizing agents such as hypochlorites and peroxides.

Cellulose. P. KRAIS. Can. 261,270, June 1, 1926. Vegetable materials are disintegrated and treated with hot alk. solns., then acted on by HNO_3 in the warm, and finally subjected to an alk. treatment.

High α-cellulose fiber. G. A. RICHTER and M. O. SCHUR. U. S. 1,599,489, Sept. 14. Unbleached pulp is pretreated with an oxidizing liquor, *e. g.*, with a Cl soln., and then cooked in lime-cooking liquor to render it suitable for making strong white paper.

Cellulose of low viscosity. E. OPFERMANN. Can. 258,531, Mar. 2, 1926. Cellulose of low viscosity in combination with oxidizing agents such as hypochlorites, per-

oxides, etc., is made by adding to the cellulose small quantities of substances having an alk. action.

Cellulose derivatives. COURTAULDS, LTD., W. H. GLOVER and E. VAN WEYENBERGH. Brit. 241,679, Sept. 15, 1924. Cellulose ethers insol. in alkali are esterified by heating with a lower fatty acid such as formic, acetic or propionic acid or by treating with the fatty acid in the presence of a catalyst such as H_2SO_4; *e. g.*, cellulose ethyl ether is heated with glacial HOAc at 70–90° or treated at 20° with the acid together with 2.4% H_2SO_4. The product is insol. in H_2O but sol. in various org. solvents and may be used for making threads or pliable films.

Cellulose derivative. L. LILIENFELD. Can. 259,930, Apr. 20, 1926. An inorg. acid ester is caused to act upon a salt of a *N*-substituted thiourethan of the cellulose group. Cf. *C. A.* **20,** 2584.

Thin films of cellulose derivatives. CELLON-WERKE, A. EICHENGRÜN. Brit. 241,590, Oct. 20, 1924. Thin films of compns. such as cellulose nitrate or acetate or a cellulose ether are formed from solns. which are applied to and afterward stripped from traveling bands which may be formed of cardboard, sheet metal, linoleum, rubberized material or cellulose acetate. Numerous mech. details are described. Cf. *C. A.* **19,** 1948

Cellulose ethers. J. ALTWEGG and C. A. MAILLARD. U. S. 1,599,508, Sept. 14. A soln of cellulose ethyl ether or other crude cellulose ether in alc. soln. is treated with a small quantity of a strong acid such as HCl and pptn. is effected by a liquid such as H_2O which is miscible with the solvent but is not a solvent of the ether being purified.

Solvent for cellulose ethers. L. LILIENFELD. U. S. 1,599,569, Sept. 14. Nitromethane is mixed with MeOH or EtOH to form a solvent for cellulose ethyl ether or other similar ethers

Cellulose ester compositions. O. SCHMIDT, T. EICHLER and K. SEYDEL. U. S. 1,600,700, Sept. 21. Compns. suitable for *making films or varnishes* are formed of a cellulose ester such as cellulose nitrate together with an ester of a paraffin dicarboxylic acid and a hydroaromatic alc , *e. g.*, dicyclohexyl oxalate or dicyclohexyl succinate.

Cellulose ester solution. J. G. DAVIDSON. Can 260,466, May 4, 1926. A compn. comprises a soln. of cellulose ester contg. a substantial proportion of a monoether of propylene glycol.

Cellulose ester solution. J. G DAVIDSON. Can. 260,463, May 4, 1926. The compn. comprises a soln. of cellulose acetate contg. a substantial proportion of ethylene glycol monoethyl ether.

Cellulose ester solution. J. G. DAVIDSON. Can. 260,464, May 4, 1926. A compn. contains a cellulose ester and a substantial quantity of poly-olefin glycol monoethyl ether.

Cellulose ester solution. J. G. DAVIDSON. Can. 260,465, May 4, 1926. Propylene glycol monoethyl ether is made by heating a mixt of propylene oxide and alc. to about 150° under a pressure of about 250 lbs. per sq. in.

Compositions of rubber and cellulose derivatives. R. GARKE, E. MEIER and W. CLAASEN. Brit. 241,858, Oct. 22, 1924. In compns wherein rubber is added to nitrocellulose for manuf. of artificial filaments for spinning, and in other similar compns , esters of tetrahydronaphthol, *e. g*, *ar*-tetrahydronaphthol acetate, are used as nonvolatile solvents or softening media. Varnishes, plastic materials, impregnating, dipping and adhesive compns. may be thus formed, which may include gutta-percha, balata or rubber and cellulose derivs. and fillers such as leather, cork, horn, ground slate, asphalt, wood meal, peat, asbestos or coloring materials.

Cellulose acetate directly spinnable from reaction mixtures. J. O. ZDANOWICH. U. S. 1,600,159, Sept. 14. A mixt. of cellulose and an acetylating agent such as Ac_2O and HOAc is treated with Cl in the presence of cellulose and the chlorinated material is treated with a substance such as SO_2 which forms a nascent condensing agent with the Cl.

Bleaching cellulose materials. G. A. RICHTER and M. O. SCHUR. Can. 259,985. Apr. 20, 1926. Wood pulp is bleached to produce a product high in resistant cellulose by subjecting the pulp to the action of Ca hypochlorite bleach liquor in the presence of NaOH sufficient to maintain a distinctly alk. condition.

Hydrating cellulose fibers. J. A. DE CEW. U. S. 1,598,267, Aug. 31. Stock is introduced into a Jordan beating engine or the like with a content of about 96% H_2O and 4% stock and a pressure of stock at the inlet of over 5 lbs. per sq. in. is maintained, which serves to increase the efficiency of the treatment. Cf. *C. A.* **20,** 1904.

Drying artificial filaments of cellulosic materials. A. FASSINI. Brit. 241,922, Oct. 23, 1924. Mech. features.

Solvent recovery. Soc. CHIMIQUE DES USINES DU RHONE. Brit. 241,871, Oct. 27, 1924. Plates or other articles formed of cellulose acetate or other colloidal cellulosic compns., which may contain other substances, are dried to remove the solvent used in their manuf. in an atm. laden with vapor of the solvents. An app. is described.

Acetylcellulose solvent. L. E. CLEMENT. Can. 261,371, June 1, 1926. An acetylcellulose solvent is constituted by a mixt. of an anhyd. alc. which is not by itself a solvent for acetylcelluloses with acetone.

Reducing viscosity characteristics of nitrocellulose. W. R. WEBB. U. S. 1,598,-949, Sept. 7. Nitrocellulose is treated with an aq bath contg. 10% HCl or other suitable acid and a penetrant org. liquid such as 50% EtOH.

Reducing the viscosity characteristics of nitrocellulose. V. E. KIMMEL. U. S. 1,598,972, Sept. 7. Nitrocellulose treated with a bath of hypochlorite, *e. g.*, $Ca(OCl)_2$.

Fiber digesting method. H. P. BASSETT. Can. 259,244, Mar. 23, 1926. Fibrous substances are treated for the production of pulp by mixing them with a soln. contg an acid sulfite and a normal sulfite in the proportions of about 7 to 9 of the former to 3 to 1 of the latter, and cooking the mixt. under the required temp. and pressure conditions to effect the desired degree of digestion.

Paper pulp. J. B. BEVERIDGE. Can. 258,265, Feb. 23, 1926. Pulp is produced by treating wood and other fibrous substances with the waste liquors obtained from the treatment of wood in aq. solns. of $NaHSO_4$, and thereafter treating with aq. solns. contg. NaOH and Na_2S.

Paper pulp. B. S. SUMMERS. U. S. 1,597,840, Aug. 31. Hydrolyzed paper pulp is formed contg. an appreciable quantity of phosphoric acid compds., *e. g.*, Na_3PO_4. U. S 1,597,841 specifies producing kraft pulp by digesting the fiber in kraft liquor contg. phosphoric acid compds. such as Na_3PO_4 which serve to toughen the product and to facilitate bleaching Cf. *C. A.* **20**, 2248.

Paper board. O. KRESS. Can. 259,160, Mar. 23, 1926. A composite moisture-proof paper board is made by uniting at least 3 sheets of paper by thin films of asphalt, one at least of the outer sheets being of sized paper and the inner or central sheet being unsized paper adapted to absorb the residual oil from the asphalt and to prevent discoloration of the sized sheet.

Pulp board. D. M. SUTHERLAND, JR. U. S. 1,598,260, Aug. 31. A mixt. of pulp and binder is formed into a board initially contg. also a quantity of H_2O approx. equal to the normal moisture of the fiber content, and the sponge board thus formed is compacted while heated and then cooled to a temp. below 100° before releasing the pressure.

Paper from wood. H. BRÄUNLICH. U. S. 1,597,717, Aug. 31. In the preliminary treatment of wood for the manuf. of paper or similar products, the steaming process is divided into 4 successive sep steps: 1st, a slow preparatory heating under a pressure up to 2-4 atm.; 2nd, a further heating under this pressure, constantly maintained, for 2-4 hrs.; 3rd, a period of 3-8 hrs. with gradual reduction of pressure to that of the atm ; and 4th, admission of H_2O with or without added chemicals to the boiler and further treatment for 4 or 5 hrs. or more. The first 3 steps may be repeated.

Pulp. R. A. MARR. Can. 260,722, May 11, 1926. Wood is digested with $ZnSO_4$ and $CuSO_4$ or $FeSO_4$, under superatmospheric pressure, and thereafter pulped.

Pulp. R. A. MARR. Can. 260,720, May 11 1926. Cellulosic material is subjected to a cooking treatment by digesting the same in a 1 to 5% soln. of a halide of an alkali-forming metal, at a temp sufficient to produce a caramel odor in the liquid, crushing and reducing the material to a pulp by mech. treatment without grinding.

Pulp. R. A. MARR. Can 260,719, May 11, 1926. Cellulosic and ligneous material is cooked with a soln. of $NaNO_3$, soaked in water, crushed and mechanically reduced to a pulp

Pulp. R. A. MARR. Can. 260,724, May 11, 1926. Cellulosic and ligneous material is cooked in a soln. contg. a double sulfate of Mg and K combined with a chloride.

Pulp. R. A. MARR. Can. 260,723, May 11, 1926. Cellulosic and ligneous material is boiled with a soln. of an alkali metal sulfate, substantially free from sulfide.

Wood pulp. G. A. RICHTER. Can. 262,608, July 13, 1926. Raw cellulosic material is digested in an acid sulfite cooking liquor, in which the free SO_2 and com-

bined SO_2 are in approx. equal proportions at 3 to 4% each, at a temp. of about 320° F. and a pressure of 75 to 95 lbs.

Wood pulp. G. A. RICHTER. Can. 259,987, Apr. 20, 1926. Raw cellulosic material is digested in an acid Na compd. cooking liquor, the acid liquor is sepd., neutralized and concd., the Na components are smelted and recovered in an alk. soln., the alk. liquor is carbonated for the conversion of certain Na compds. to Na_2CO_3, and the alk. liquor is acidified with SO_2 to produce an acid cooking liquor, which is clarified.

Wood pulp. G. A. RICHTER. U. S. 1,598,880, Sept. 7. The spent liquor resulting from the alk. digestion of unbleached cellulose pulp is treated with SO_2 and the resulting acid liquor is then used to cook the raw cellulosic material.

Loading fibrous material. H. R. RAFSKY. U. S. 1,598,104, Aug. 31. Fibrous material such as that for *paper manuf.* is loaded or filled with $CaCO_3$ and $Mg(OH)_2$ which are in a state of extremely fine subdivision.

Paper size. J. A. DE CEW. Can. 260,716, May 11, 1926. A colloidal soln. of Al resinate is produced by dissolving a resin soap in a protective colloid, dissolving $Al_2(SO_4)_3$ in a protective colloid, and mixing the solns.

Paper size. W. C. LODGE. Can. 261,906, June 22, 1926. Finely divided mineral matter is mixed with water, wax is added and intimately mixed.

Xanthate reaction on paper stock. W. W. CARTER. U. S. 1,598,640, Sept. 7. The depth of the xanthate reaction on paper stock is limited by loosely confining the stock to permit only a limited swelling.

Paper half stock. A. MACKAY. U. S. 1,599,831, Sept. 14. In the sep. hydration of 2 batches of cellulose fibers, 1 of the batches is subjected to a stronger chem. hydration than the other, each batch is separately beaten during its chem. hydration, and portions of each batch are mixed in such relative proportions as to produce paper of the desired grade.

Bleaching paper pulp. W. D. GREGOR, W. M. OSBORNE and A. J. KEMZURA. U. S. 1,597,880, Aug. 31. Wet unbleached pulp is mixed with a bleaching agent in an amt. sufficient only partially to bleach the pulp at a temp. of about 22°, the reaction is permitted to proceed until the activity of the bleaching agent is substantially exhausted, the partially bleached pulp is washed and it is further treated with bleaching agent in quantity sufficient to effect the desired bleaching at a temp. of about 30°.

Machine-glazed paper. J. M. WARD. U. S. 1,598,793, Sept. 7. A glazed effect is produced on 1 side of paper by a Yankee drying cylinder and the rough side is finished by the progressive action of pressure rolls while drying on the cylinder.

Paper-coating apparatus. C. W. MAYER. U. S. 1,598,924, Sept. 7.

Coating paper and similar materials. DR. BAUMGÄRTNER, KATZ & CO., GES. Brit. 241,876, Oct. 27, 1924. In coating vessels or plates of paper pulp with size, gelatin, casein, mucilage or the like, the articles are first moistened with an aq. soln. of NH_3 or other alk. substance or such a soln. is added to the coating medium, to improve penetration and retention of the coating. The alk. soln. may contain salts which will react with pptg. media in the sizing liquor to form sulfates, phosphates, fluorides, sulfides or oxides and the sizing may contain CH_2O or other suitable hardening or preservative substances.

Paper-making apparatus. H. J. MEADER. U. S. 1,600,689, Sept. 21.

Paper-making apparatus. J. D TOMPKINS. U. S. 1,599,503, Sept. 14.

Beating engine for paper pulp. J. T. MURPHY. U. S. 1,599,141, Sept. 7.

Paper-machine drier felts. E. D. WALEN. Brit. 241,560, Oct. 16, 1924. Cotton drier felts are treated with a mixt. of Na silicate and a sol. oil dissolved in H_2O to lubricate the fibers and provide an alkali in the felt which will neutralize acid present and thus prolong the life of the felt.

Sulfur dioxide recovery from blow-pit gases. G. A. RICHTER and W. B. VAN ARSDEL. U. S. 1,599,490, Sept. 14. For recovery of SO_2 from the gases and steam liberated in the blow pit during the blowing operation of a sulfite charge, the gases and steam are passed counter-current in direct contact with relatively cold H_2O so as to condense only a portion of the steam and partially to cool the gases, and the gases are further cooled without absorption, and condensation of another portion of the steam is effected by passage in contact with relatively cold inert interstitial material.

Producing solids from sulfite cellulose waste liquor or similar materials. W. H. DICKERSON. U. S. 1,600,503, Sept. 21. Waste sulfite liquor or other substances which at some degree of concn. are sticky, viscid and sirupy are sprayed into a current of heated drying gas at approx. its hottest portion, passed through a drying chamber to form glazed particles and the latter are sepd. from the gas.

Sulfate production. G. A. RICHTER. Can. 259,984, Apr. 20, 1926. Waste alk.

cooking liquor contg. NaOH and Na_2S is concd., the Na compds. are smelted in a reducing atm. and recovered in an aq. soln.; waste acid cooking liquor contg. Na salts is concd., and is neutralized with a portion of the alk. liquor; the Na compds. of the neutralized liquor are smelted in an oxidizing atm. and recovered in an aq. soln.; this soln. is acidified with SO_2 for use in cooking raw cellulosic material.

Sulfite digester liquors. G. A. Richter. U. S. 1,599,488, Sept. 14. Insol. monosulfite is pptd. from digester relief liquor, without substantial pptn. of org. substances, *e. g.*, by $CaCO_3$ and the monosulfite is then converted into bisulfite by SO_2 for recovery and use as cooking liquor.

24 EXPLOSIVES AND EXPLOSIONS

CHARLES E. MUNROE

Report of chief inspector of explosives of Victoria for 1925. Reg. J. Lewis. Pamphlet 12 pp., Melbourne, 1926.—Statistics are given of the manuf., importation, exportation and use of explosives and accidents are reported. A large percentage of the accidents was from detonators which were "found" by youths. It is of special interest that licenses were issued to manuf. rackarock. Charles E. Munroe

High explosives. C. J. Bain. *Army Ordnance* **7**, 49–52(1926).—Owing to war emergencies and the adoption of explosives not previously adopted by the service, material was received that lacked keeping qualities or was in other respects not wholly satisfactory. All these problems are now being studied with a view to securing under war conditions an abundant supply of satisfactory high explosives. The article rehearses the methods pursued and the progress made. Charles E. Munroe

Safety in explosives plants. H. S. Deck. *Army Ordnance* **7**, 33–7(1926).—An account of the methods and app. employed at Picatinny Arsenal in the study of means for promoting safety in the manuf., handling and use of military explosives. It deals not only with explosives but also with the materials with which they may be brought in contact and which may affect their safety. Thus the "Flint lock powder testing device," employed in testing the ignition of explosives by sparks, is also used for detg. the sparking properties of engineering materials. Attention is being given to the production of static charges by moving parts and in the removal of solvents; the means of preventing such accumulations, and the relative susceptibility of the different materials to ignition by static charges. As machining of explosives, such as boring, drilling and facing them, is an important part of loading operations, this is being made the subject of research and special tools have been devised. An ingenious indicator to be affixed to a magazine through which to show the nature of the menace of its contents is depicted. It is proposed to put the data obtained in the hands of designers of equipment and processes, safety boards and others. Fire fighting in explosives works is also being studied. Charles E. Munroe

Loading ammunition at Picatinny Arsenal. John P. Harris, *Army Ordnance* **7**, 40–8(1926). Charles E. Munroe

The Picatinny Arsenal powder factory. F. H. Miles. *Army Ordnance* **7**, 9–12 (1926).—A well-illustrated historical account of this factory for the manuf. of S.P. (smokeless powder) and of F.N.H. (flashless, nonhygroscopic) S.P. As the powders become more flashless they become more noiseless. Today the flash is a dull red glow, visible, under the best conditions, for but 300–400 yards, and entirely invisible with a muzzle below the military crest of a hill. The noise has been reduced to such an extent that the sound ranging equipment developed during the war is quite ineffective, at least for the smaller guns and howitzers. The smoke is that given off by the black powder igniting charge and when a smokeless igniter is produced smokelessness will be had. Charles E. Munroe

Research activities at Picatinny Arsenal. G. C. Hale. *Army Ordnance* **7**, 13–7 (1926).—The importance of research to industry is stressed, the military advantage Germany possessed over other nations in having done this extensively prior to 1914 is pointed out and the guiding and governing principles in conducting researches on propellents, high explosives, initiators, boosters and pyrotechnic compns. at Picatinny Arsenal are set forth with examples. Charles E. Munroe

The influence of pressure on the formation of explosion waves. P. Dumanois and P. Laffitte. *Compt. rend.* **183**, 284–5(1926).—D. and L. studied the effect of pressure on the formation of explosion waves in the mixt. H_2 and O. By detn. of the distance traveled by the flame from the ignition point to the point of formation of

the explosion wave they found that increasing pressures at first decrease this distance rapidly and then more slowly. D. H. POWERS

The explosive properties of the silver salts of some of the nitro-aromatic compounds and silver oxalate. C. A. TAYLOR AND E. P. BUXTON. *Army Ordnance* **7**, 68–9(1926).—This records the prepn. and properties of Ag picrate, trinitroresorcinate and oxalate and the Ag salt of hexanitrodiphenylamine. The properties included m. ps., explosion temps., sensitiveness to impact and solubilities. None was found an efficient detonating agent and all were much inferior to $Hg(ONC)_2$ as initiators. C. E. M.

Explosibility of oil-shale dust. V. C. ALLISON AND A. D. BAUER. *Repts. of Investigations, Bur. Mines*, Serial No. **2758**, 8 pp.(1926).—Oil-shale dusts form explosive mixts. with air the more readily the greater the combustible content of the shale Formation of dust in the mining and handling of oil-shale is almost unavoidable and the same precautions should be taken against dust explosions in industries producing or working with oil-shale as are taken in safely operated coal mines. C. E. M.

Confining an explosive reduces the carbon monoxide and hydrogen content of resultant gases. J. E. CRAWSHAW AND G. W. JONES. *Coal Age* **30**, 283–5(1926).—All the most commonly used high explosives contain insufficient O to burn the entire C and H contents to CO_2 and H_2O and they therefore tend on explosion to give rise to inflammable H and CO in the products of explosion which may form explosive mixts. in the mine, while the CO is further objectionable because of its poisonous qualities. Continuing their investigations on the effects of confinement on the products of detonation of explosives (*C. A.* **20**, 824), C. and J. have detonated 14 different permissible explosives first *in vacuo* and then confined by 1 pound of stemming. *In vacuo* these explosives yielded from 4.35 l. of CO and 7 of H up to 20.15 of CO and 19.75 of H, while under the confinement stated they obtained from 3.20 l of CO and 2.30 of H up to 15.35 of CO and 6.35 of H. The data given are for the first and last explosive on the list. The reduction of CO and H contents was of a similar order to the above for each explosive tested. The products of detonation were discharged into an atm. of N, contg. less than 2% of O, to prevent "after-burning." CHARLES E. MUNROE

Fires caused by nitric acid. ABEL CAILLE. *Chimie et industrie* **16**, 321–4(1926).—It is generally considered that 36–40° Bé. HNO_3 cannot cause spontaneous combustion of straw. C. describes expts. showing that under suitable conditions, when the heat generated by the action of the 36° Bé. acid on the straw cannot escape, the temp. may rise sufficiently to cause concn. of the acid with ultimate combustion of the straw Such conditions can readily be encountered in the transportation or handling of HNO_3, and proper ventilation is essential to the reduction of the fire hazard. A. P.-C.

The ignition of firedamp by momentary flames. Pt. I. N. S. WALLS AND R. V. WHEELER. **Pt. II.** W. RINTOUL AND A. G. WHITE. Safety in Mines Research Board. *Paper* No. **24**, 18 pp.(1926).—R. and W. find the ignition of mixts. of CH_4 + air, when exposed to flame, does not occur instantaneously. There must be a definite duration of exposure dependent on the character of the flame. With a small flame the duration of exposure for the most readily ignitible mixt. is about 7 millisecs., with a larger flame about $3^1/_2$ millisecs. The duration of the flame of an unstemmed 16 oz. charge of a coal mining explosive, as judged by photography, varies between 0.25 and 2.5 millisecs., dependent on the detonation conditions. The mixts. of CH_4 + air most readily ignited by a fully aerated flame contain between 9 5 and 10% CH_4. If the flame is not fully aerated, and can abstract O from the mixt. to which it is applied, the most readily ignitible mixts. are those contg. an excess of O. This behavior is noted when underoxidized explosives are fired in mixts. of CH_4 + air. From the fact that the mixts. of CH_4 + air most readily ignited by fully oxidized explosives contain less CH_4 than the mixts. most readily ignited by flame suggests that the flame of an explosive is not solely responsible for its power to ignite gaseous mixts. Using another form of app. R. and W. find the most readily ignitible mixt. varies with variations in the O balance of the igniting flame. Considering that the igniting gases and the CH_4 + air mixt. may interact to some extent before ignition, this is what might reasonably be expected. Under such circumstances a flame of considerable O deficiency would ignite most readily a mixt. contg. some excess of O. The most readily ignitible mixts. contain continually decreasing amts. of CH_4 with increasing O deficiency of the igniting flame. The lag on ignition of a CH_4 + air mixt. is less the hotter the igniting source. When the primary gases of the igniting flame are present in different proportions, each different proportion representing a different deficiency of O, the central zone of the flames produced will be the hotter and the mean flame temp. the greater the less the O deficiency is. Consequently, the lag on ignition of any mixt. will be shortest with the igniting flame of the lowest O deficiency. CHARLES E. MUNROE

The limits of inflammability of firedamp and air. M. J. Burgess and R. V. Wheeler. Safety in Mines Research Board, *Paper* No. **15**, 21 pp.(1925).—A marked effect on the limits is produced by the direction the flame takes, an effect due to convection currents. The widest range of inflammability occurs during upward propagation of flame and the narrowest during downward propagation. For horizontal propagation the values were intermediate. For upward propagation the lower-limit is the least when the mixt. is unconfined. The upper limit is greatest when the mixt. is totally confined. The degree of confinement of the mixt. appears to produce no effect on the limits for horizontal propagation. Such variations in temp. and pressure as ordinarily occur in coal mines have no appreciable effect on the limits for firedamp. A mixt. of firedamp and air, contg. about 5% of firedamp, can propagate flame under certain limiting conditions of turbulence of the mixt., or when the mixt. is traveling as a slow current. The significant values for the limits for mixts. of CH_4 and air only at ordinary mine temps. and pressures, in quiescent mixts., are, in CH_4 percents: (*A*) Upward propagation; mixt. totally enclosed: 5.4 and 11.8. (*B*) Upward; mixt. free to expand: 5.25 and 14. (*C*) Horizontal; mixt. either confined or free: 5 4 and 14.3. (*D*) Downward; 6 and 15.4. For mixts. traveling as currents the lower limit is 5.05% CH_4 when the speed of the current is between 69 and 128 ft. per min. For turbulent mixts the lower limit is 5%. The upper limits have not been detd. for the last 2 conditions. Water vapor does not affect the lower limit appreciably. The reduction of O content of the air narrows the limits (the upper being most affected) until, when it contains but 13% O, they coincide and only one mixt. contg. 6% CH_4 can propagate flame. If the diminution of O is due to addn. of CO_2, the limits are narrowed more rapidly owing to the sp. heat of CO_2 being higher than that of N. The effect of another combustible gas depends on the nature of that gas and can be calcd. from the known values of its limits of inflammability with air. Charles E. Munroe

The occurrence of fire damp in bituminous coal mines. Frank Haas. *Trans. Am. Inst. Mining Met. Eng* (pamphlet) No. **1585-F**, 9 pp.(1926).—A study of numerous mines shows the fire boss with his safety lamp and daily chem. detns of CH_4 in the mine gas are the present means of showing fire damp concn. However, it is impossible to predict the amt. of gas, expected to be evolved, from any data obtained. The relation of coal mined and vol. of gas in a West Virginia mine and the daily fluctuation of gas with tonnage and barometer in another mine are charted. W. H. B.

Determination of the fineness of coal dust. E. F. Greig. Safety in Mines Research Board, *Paper* **25**, 3-31(1926).—The phys. quantity that measures the fineness of a particle, from the point of view of its reactivity, is its sp. surface, *i. e.*, the rates of its surface to its mass. The dangerousness of a dust deposit depends not only on the av. sp. surface of the dust as a whole, but on the distribution of sp. surfaces throughout the dust. Air elutriation methods provide means of obtaining grades of dusts of definite ranges of sp. surfaces for the purpose of correlating sp. surface and degree of inflammability of a dust cloud. By a combination of elutriation, sedimentation and microscopic examn., it is possible to analyze the sp. surfaces of dusts. Of the empirical methods of detg. the av. sp. surface of a dust that have been examd., some may be found suitable for rapid detns., and probably for field use. Attention is called to the value of bulk-d measurements as a criterion of the air contents of dusts and powders. A meaning is given to sieving figures, based on the sp. perimeter of the screens used. Charles E. Munroe

Rate of combustion of coal dust particles. II. Effect of particle size upon pressure increase attending inflammation of coal dust. C. M. Bouton and J. H. Hayner. Carnegie Inst. of Technology, *Mining and Metallurgical Investigations Bull.* **22**, 1-23 (1925); cf. *C. A.* **19**, 2254.—The relative inflammabilities, as detd. by means of a modified Clement-Frazer app., are described for four sizes (0-10, 10-15, 15-25, 25-74 μ) of Pittsburgh and Pocohontas coal The very fine particles of coal dust are less inflammable when suspended as a dust cloud than are somewhat coarser particles. The range 10-25 μ in diam. includes particles of max. inflammability. Formerly it had been generally accepted that the explosibility of coal increased as the fineness of the dust increased. Improvements in the app. for the sepn. of fine sizes of dust by air elutriation are described. E. G. Meiter

Factors in the ignition of methane and coal dust by explosives. G. St. J. Perrott. *Trans. Am. Inst. Mining Met. Eng.* (preprint) **1604-F**, 13 pp.(Oct., 1926).—An air-space between the explosive and stemming reduces the safety somewhat. The conditions of greatest relative safety are loading the explosive tight in the borehole and tamping it with either a distinctly moist inert stemming such as damp fireclay or a finely pulverized stemming such as rock dust. The use of coal dust as stemming increases the

likelihood of the ignition of gas or dust from a blown-out shot. The explosive gas mixt. most sensitive to ignition by permissible explosives contains from 7.5 to 8% of natural gas. On either side of the limits 7 to 8.5 the sensitiveness diminishes rapidly. A balanced explosive is most likely to cause an explosion of a 7 to 8.5% mixt. but an under-oxidized explosive is more likely to cause ignition of gas mixts. near the lower limit and this is the condition most commonly met with in practice. Definite indications were obtained that an explosive having the higher rate of detonation is the more likely to ignite a gas + air mixt. Photographs of flames from explosives fired in air serve to divide explosives into groups as regards safety, and, taken in connection with the compn. of the explosive and its rate of detonation, promise to throw light on the mechanism of ignition. CHARLES E. MUNROE

Extinction of methane flames by diluent gases. H. F. COWARD AND F. J. HARTWELL. *J. Chem. Soc.* **1926**, 1522–32.—The limits of inflammability of CH_4 in atms. of air mixed with CO_2 or N, A or He were detd. and the factors responsible for the extinction of flame found were (1) reduction of O content by the diluent gas, (2) the thermal capacity, and (3) the thermal cond. An exact treatment of the subject demands a knowledge of thermal conds. of certain mixed gases up to temps. of 1000–1500° but such data are not available. The thermal capacity effect is marked in the case of A. The lower limit for CH_4 is reduced from 5 24% in air to 4.4% in an atm. composed of 47% A and 53% air, and to 3.95% in an atm. of A with just sufficient O to burn the CH_4 completely. The thermal cond. effect is marked when the limits in atms. composed of air to which A has been added are compared with those formed with He. Payman's "limits generalization" held fairly accurate over the whole range of mixts. investigated except near the point where the lower and higher limits meet. Of all mixts. of the two that of the proportions $CH_4 + 2O_2$ is the last to become non-inflammable as inert gases (N or N with CO_2, or A or He) are added in increasing amt. There was a parallel between the "lags" on ignition and the diln. limits of such mixts. as were used and it is suggested that both are dependent on the same factors in the case of any one inflammable gas. CHARLES E. MUNROE

Extinction of methane by helium. H. F. COWARD AND G. W. JONES. *Repts. of Investigations, Bur. of Mines,* Serial No. **2757**, 5 pp.(1926).—The results of these expts. confirm the authors in the previously expressed opinion that in general the factor of thermal capacity is predominant in detg. the relative extinctive effects of 2 diluent gases but they now add that when a gas of very different thermal conductivity is introduced this factor will become important. CHARLES E. MUNROE

Extinction of methane-air flames by some chlorinated hydrocarbons. H. F. COWARD AND G. W. JONES. *Ind. Eng. Chem.* **18**, 970–4(1926).—Exptl. results are shown on the limits of inflammability of CH_4 in atms. of air mixed with CO_2, N_2, He, and as diluents, followed by those showing the influence of vapors of several chlorinated hydrocarbons on the inflammability limits of CH_4 in air. The C_2H_6 derivs. behave like inert diluents and the C_2H_4 derivs. contribute to the inflammability of the mixt. The order of increasing combustibility in both cases is $C_2Cl_4 \longrightarrow C_2HCl_3 \longrightarrow C_2H_2Cl_2$, and in the latter case the vapor forms inflammable mixts. with air without the help of any CH_4. The extinctive effect of CCl_4 on CH_4 flames is probably entirely due to the cooling action, which its high thermal capacity makes so marked. W. H. B.

Pyrotechnics. I. A. CRUMP. *Army Ordnance* **7**, 23–6(1926).—Before the Armistice stopped production hundreds of thousands of signal rockets, position lights, rifle lights, V. B. cartridges, Very pistol cartridges and airplane flares had been produced. Being before the war a subordinate feature of war material no standard designs for war purposes had been adopted. Hence there was confusion in prepn and many instances of malfunctioning. This article details the steps being taken to remedy these conditions. Among the interesting illustrations is that of the exptl. 1,000,000-c. p. illuminating flares. CHARLES E. MUNROE

Fuses. Modern requirements and the type of organization necessary for fuse development work. H. M. BRAYTON. *Army Ordnance* **7**, 27–32(1926).—A review of the requirements and functions of fuses and the conditions their explosive charges must meet, with detailed illustrations showing the construction and sep. components of fuses. CHARLES E. MUNROE

Detonators and tests for them. C. S. HURTER. *Eng. Mining J.* **122**, 500–1 (1926).—A review of the various tests of efficiency used in the industries.
CHARLES E. MUNROE

2,3,4-Trinitrotoluene (GORNALL, ROBINSON) **10.** Storing C_2H_2 or other explosive gases (Brit. pat. 241,468) **13.**

Explosives. E. von Herz. Brit. 241,892, Oct. 23, 1924. The salts of isonitramines are used in detonators or detonating compns. and other ingredients may be pptd. simultaneously with them. They may be prepd. by treating ketones or nitroparaffins in an alc. soln. with N_2O in the presence of NaOEt.

Porous mass for storing explosive gases. G. Dalen. Can. 258,565, Mar. 2, 1926. Granulated kieselguhr in a compact condition is used for storing explosive gases.

Fire-arms cartridge for disseminating chloroacetophenone or other gas-generating chemicals. B C. Goss. U. S. 1,600,223, Sept 21

Detonator. D Corrie. U. S 1,599,078, Sept 7. Structural features of fulminate tubes are specified.

Detonating fuse. R. Mallet U S 1,598,920, Sept. 7. A plurality of interconnected tubes formed of refractory material such as metal are filled with TNT, melinite or other detonating explosive, except at the ends of the tubes, which have ordinary fuses attached.

25 DYES AND TEXTILE CHEMISTRY

L. A. OLNEY

A list of the dyes covered by patents owned by the Chemical Foundation, Inc., with patent and "Color Index" numbers. Chas E. Mullin. *Textile Colorist* **48,** 385-7 (1926) Chas. E. Mullin

Oil-soluble aniline colors, a mystery. G. A. Prochazka. *Chemicals* **26,** No. 7, 19-20(1926) —Two types of oil-sol dyes are used; the one is prepd. directly from unsulfonated intermediates, the other by uniting the color base with a fatty acid Of the first group only a few colors are available but they are faster than the fatty acid compds. The methods of using and testing the colors and the dyed products are briefly discussed Chas. E. Mullin

Dyestuffs used in the dyeing of silk goods. Jacob Richter. *Chemicals* **31,** No. 3, 19-20(1926) —The various classes of dyes are considered in relation to silk dyeing. Chas. E. Mullin

Nitrosodialkylaniline, dyes therefrom, safranine and Meldola blue. A. Cobenzl. *Chem.-Ztg* **50,** 494-5(1926) —A review Details of prepn. are given. M. J

Theory of dyeing. E Elod. *Textilber* **6,** 742-3(1925).—The quant. absorption of dye by wool is independent of the p_H of the bath. The *isoelec. point of wool* cannot be definitely defined as it is the resultant of the isoelec. points of several substances, the relative proportions of which vary considerably with the wool and its previous processing. E. R. Clark

Correct use of color terms. J Merritt Matthews. *Textile World* **70,** 1140 (1926) —A protest against the wide indiscriminate use of the word "shade" in color nomenclature, pointing out the difference between "depth of color" and "color intensity" Chas E. Mullin

Dyeing cotton with vat dyestuffs. Kurt Brass *Textilber.* **6,** 673-4(1925) -- The alkali salt of the reduced color, *i e*, of the vat acid has no affinity for cotton as was shown by expts. conducted under N. Probably atm. CO_2 liberates the vat acid in dyeing. E. R. Clark

Preparing and dyeing of cotton draperies. L. J. Matos. *Dyestuffs* **27,** 135-6 (1926).—Suggestions for dyeing pile fabrics. Chas E. Mullin

Practical use of Idigosol O. Gustav Friedländer. *Textilber.* **7,** 697-8, 781-3 (1926).--Recipes, covering nitrite, and steaming processes, mixts. with direct and chrome colors, and several discharge styles. E R. Clark

Spray printing and the use of stencils. M. Appelbaum. *Chemicals* **26,** No. 7, 30(1926) -General Chas. E. Mullin

Study of desizing agents. A. Hesse. *Textilber.* **7,** 689-92(1926). **Remarks on same.** R Haller. *Ibid* 692 —The correct index of the value of a starch solubilizing agent is the viscosity of the suspension after a certain very definite treatment. Hesse criticizes the accuracy of Haller's methods in evaluating activin for this purpose (*C. A* **20,** 1721). Haller admits the inaccuracy of his data but contends that his results are sufficiently accurate for the purpose. Notes on German com. prepns. are given. E. R. Clark

Stains produced in milling. Anon. *Dyestuffs* **27,** 142-3(1926).—Oxalic acid, or oxalic plus HCl, is recommended for the removal of Fe stains, and a 2% KCN soln. for Cu stains. Chas. E. Mullin

Waterproofing by impregnation. Ismar Ginsberg. *Textile Colorist* **48,** 379-

82(1926).—The use of Al salts, cuprammonium solns., and linseed oil are discussed. CHAS. E. MULLIN

Tanahashi's evenness-graph. KEIZO TANAHASHI. *Silk J.* **3,** 46–7, 50(1926).—A description of the machine and the results obtained by its use in detg. the uniformity in the breaking strength of silk. CHAS. E. MULLIN

Comparative tests of substances which aid in wetting (textiles). J. AUERBACH. *Textilber.* **7,** 681–5, 775–8(1926).—Samples of cotton and woolen cloth were used to test the wetting out efficiency on a weight for weight basis of some of the newer com. prepns. and the standard materials used for this purpose. The criterion used was time for sinking. The bath tests included plain water for wool, carbonizing acid for wool, and mercerizing lye for cotton. "Oranit," "Nekal A" and" Neomerpin" were more effective than 50% turkey-red oil, tetracarnite and monopol soap, although it is suggested that a better basis for comparison would be amts. which cost the same. E. R. CLARK

Some special finishes on textiles. ANON. *Chemicals* **26,** No. 7, 22–4(1926).—A brief discussion of some special finishes on cotton, wool and silk goods. CHAS. E. MULLIN

A modern finishing softener (for textiles). M. NOPITSCH. *Textilber.* **7,** 688–9 (1926).—A sulfonated oil which may be used with $MgSO_4$ is sold as "Appret-Avirol E." E. R. CLARK

Temperature and moisture content. C. F. G. *Textile World* **69,** 3961(1926).—The recent work upon the regain of cotton is applied to aging, drying and finishing operations. CHAS. E. MULLIN

Grading cotton by measurement. THEODOR BUHLER, JR. *Faserforschung* **5,** 205–26(1926).—The present system of cotton grading operates better for the broker than for the spinner. Permanent standards are not set. Measurements show that many errors in grading exist. E. R. CLARK

Causes of yellowing of bleached cotton. J. MERRITT MATTHEWS. *Textile World* **70,** 593–5(1926).—Among the causes of yellowing are improper preliminary scouring, insufficient rinsing during the bleaching process resulting in insol. Ca and Fe salts remaining in the fiber which may have a catalytic action on the cellulose, failure to remove acidic or alk. materials before drying, oxycellulose due to over-bleaching, improper finishing materials, and too high a temp. in drying. The permanency of the white may be tested by heating for 4 hrs at 100° to 110°, or treatment with a soda-ash soln. or NH_3 vapors. CHAS. E. MULLIN

The weighting of silk. F. H. UNTIEDT. *Textile Colorist* **48,** 315–8, 387–90(1926).—A complete patent *bibliography* of the U. S., British, German and French patents on the weighting of silk is given, with abstracts of the patents. CHAS. E. MULLIN

Silk, rayon and humidity. C. F. GOLDTHWAIT. *Textile World* **70,** 894(1926).—Silk and viscose follow the changes in relative humidity of the atm. with changes in regain very rapidly. Both the tensile strength and elongation change with the regain. CHAS. E. MULLIN

Characteristics and uses of spun rayon. J. W. COX. *Textile World* **69,** 3967–71 (1926).—The properties and uses of spun rayon are considered. CHAS. E. MULLIN

Two common defects in rayon fabrics. H. R. MAUERSBERGER. *Textile World* **70,** 327–9(1926).—While dyeing defects may be caused by faulty weaving, etc., it may also result from variations in the concn. of the coagulating bath. CHAS. E. MULLIN

Stability of nitro rayon. HERMANN STADLINGER. *Textilber.* **7,** 685–7, 770–3 (1926); E. RISTENPART. *Ibid* 774–5.—S. argues thatt he test for labile H_2SO_4 esters proposed by R. which included boiling 1 hr with 1% HOAc and then drying and heating 1 hr. at 135° is too severe and that few com products will meet this test. S contends that 30 min. boiling and 15 min. heating at 127° together with dynamometer tests are ample. R. replies that tendering, loss of luster, and change of shade in storage are serious matters and that his test is correct. E. R. CLARK

Russian flax literature for 1925. F. TOBLER. *Faserforschung* **5,** 261–8(1926).—The data are largely agricultural and statistical, covering such points as thickness of seeding, fertilizers and yields. Factory retting by the common European processes is shown to require 50–100% more labor than the dew retting practiced by the farmers. E. R. CLARK

Effect of thickness of seeding on flax. A. STROBEL. *Faserforschung* **5,** 227–38 (1926).—Exptl. plots were so laid out that the distance between the plants was the same as between rows, and this distance was varied from 3 to 10.3 cm. with 10 intermediate spacings. Analyses of the straw with tops and roots cut off showed progressive variation with increased spacing as follows: fiber 21.5–10.6%, wood 55.6–61.5%,

water 9.0–1.3%, pectin 13.92–26.5%, oil content of seeds 39.7–35.9%. Increased spacing apparently favors pectin at the expense of fiber. The straw was pulled 86 days after sowing. E. R. CLARK

Thickness of seeding and stem diameter of flax. WILLY MÜLLER. *Faserforschung* **5**, 239–55(1926).—The most prominent effect of heavy seeding is fine-stemmed straw. In order to show the effects of fine *vs.* coarse stems, bundles of 100 stems each were prepd. from a good field of flax, in which the straw diam. was very closely similar. Bundles were made of 2.0–0.5 mm. straw in 1 mm. stages. These bundles were then examd. separately, after the roots and tops were removed. The av. wt. varied from coarse to fine from 0.9113 to 0.0525 g., and the length was a max. for 1.5–1.8 mm. Fiber content increased from 18.4 to 24.5%, and fiber diam. decreased from 22.16 to 15.84. Straw of 1.3–1.7 mm diam. is best, all things considered. Photomicrographs and a bibliography are given. E. R. CLARK

The carroting of hair used for making felt hats. GABRIEL JOSSIER. *Halle aux cuirs* **1926**, 245–50.—A description of the process and discussion of the prevention of Hg poisoning among the workmen. H. B. MERRILL

Thiophenolsulfonic acid mordanting agents (U. S. pat. 1,600,525) **29.** 1-Arylimino-2-naphthoquinones (U. S. pat. 1,599,444) **10.** Loading fibrous material (U. S. pat. 1,598,104) **23.** Testing porosity of heavy fabrics (U. S. pat. 1,599,964) **13.**

HEERMANN, P.: **Technologie der Textilveredelung.** Berlin: Julius Springer. 632 pp. M. 33. Reviewed in *Textile Inst.* **17,** 136(1926).

Preparation of haloalkyl or haloalkylaryl carboxylic acids and dyes derived from them. H. C. J. H. GELISSEN. Dutch 14,663, June 15, 1926. A new group of intermediate acids is prepd. by the action of org. peroxides (water-bath temp.) on halogenated aliphatic or aromatic hydrocarbons. From the reaction product (*e. g.*, *p*-CCl_3-$C_6H_4CO_2H$ from CCl_4 with $(BzO)_2$) important dyes can be prepd.

Dyes. SANDOZ CHEMICAL WORKS and M. BONIGER. Brit. 241,435, Feb. 7, 1925. Monoazo dyes are obtained by coupling 1-(2,5-dichloro-3-sulfophenyl)-3-methyl-5-pyrazolone (I) with diazo compds. such as those of aniline, its homologs and sulfonic acids, sulfonamides, carboxylic acids and β-naphthylaminesulfonic acid. The dyes produce yellow or greenish yellow shades on wool from an acid bath. I is prepd. from *p*-$C_6H_4Cl_2$ by sulfonation, nitration and reduction, conversion of the resulting *p*-dichlorometanilic acid into the corresponding *p*-dichlorophenylhydrazine-*m*-sulfonic acid and condensation with $AcCH_2CO_2Et$.

Dyes. FARBENFABRIKEN VORM. F. BAYER & CO. Brit. 241,527, Oct. 20, 1924. A sulfonated, unsulfonated or carboxylated acylphenylenediamine or naphthylenediamine (*e. g.*, 2,5-$H_2N(AcNH)C_6H_3SO_3H$) is coupled with an aminonaphthol ether or a sulfonic acid of the same (*e. g.*, 1,2,6-$H_2N(EtO)C_{10}H_5SO_3H$), the product is further diazotized and is coupled with a 1,8-dihydroxy- or aminohydroxynaphthalenesulfonic acid. The dyes thus formed produce fast, easily dischargeable shades on silk. Tetrakisazo dyes are prepd. by using the urea derivs. of phenylenediamines, *e. g.*, *p*-diaminodiphenylurea, as first components in a similar process.

Dyes. SOC. ANON. POUR L'IND. CHIM. À BÂLE. Brit. 241,572, Oct. 16, 1924. Azo dyes obtained by reducing the products made by coupling nitrated diazotized 1-amino-2-hydroxynaphthalene-4-sulfonic acid with a naphthol are converted into sol. Zn compds. by treatment with reagents such as $ZnCl_2$ dissolved in caustic alkali or ammoniacal Zn chloride or hydroxide. They dye wool violet to brown-black tints changed to gray or black by after-chroming.

Dyes. BADISCHE ANILIN & SODA FABRIK. Brit. 241,437, Feb. 12, 1925. Mixts. of dibenzanthrone with nitrodibenzanthrone are prepd. for dyeing cotton black from a hyposulfite vat.

Dyes. H. F. RAEDER and W. W. MIEG. U. S. reissue 16,427, Sept. 21. See original pat. No. 1,508,409 (*C. A.* **18,** 3727).

Dyes. AKT.-GES. FÜR ANILIN-FABRIKATION. Brit. 241,270, July 15, 1924. The products obtained by alkali fusion of 8-sulfo-1,2-naphthophenazines or 8-sulfo-1,2-dinaphazines are converted into vat or pigment dyes by treatment with halogenating agents.

Dyes. A. ZINKE. Can. 262,777, July 20, 1926. Diaryl-halogen-perylene-ketones are treated with molten alkalies.

Dyes. F. STRAUB. Can. 260,737, May 11, 1926. A Cr compd. of an azo dye-

stuff capable of being chromed is caused to act on a triarylmethane dyestuff capable of being chromed.

Dyes. F. STRAUB and H. SCHNEIDER. Can. 260,738, May 11, 1926. 3-Amino-4-hydroxy-5-sulfamyl-1-naphthalenesulfonic acid is prepd. by sulfonating 1,8-naphthosultone, treating it with agents adapted for introducing into its mol. the —$N(O)_x$ residue, *x* standing for a whole number smaller than 3, *i. e.*, nitrous or nitric acid, causing NH_3 to react on the sultone, and reducing the product. Cf. *C. A.* **20**, 3088.

Dyes. F. STRAUB, J. SPIELER and H. SCHNEIDER. Can. 260,739, May 11, 1926. Hydroxynaphthalenesulfamides other than the 1-hydroxynaphalene-8-sulfamides are coupled with o-hydroxydiazo compds. and the *o*-hydroxyazo dyestuffs thus obtained are treated with agents yielding metals.

Dyes. F. STRAUB, G. DE MONTMOLLIN, J. SPIELER and C. VON PLANTA. Can. 260,740, May 11, 1926. Dyestuffs of the general formula R_1—N = N—R_2, where R_1 is any aromatic nucleus carrying an OH group in *o*-position to the azo group and R_2 is the residue of an acetoacetic acid deriv., are treated with agents yielding Cr.

Emulsions of dyes. C. E. J. GOEDECKE and COLLOISIL COLOUR CO., LTD. Brit. 241,331, Aug. 16, 1924. Colloidal solns. or emulsions of dyes, *e. g.*, auramine, S green or Ponceau, are prepd. by mech. working together the dye, a solvent, in insufficient quantity to dissolve the whole of the dye, and a third material which does not form a lake with the dye but produces a colloidal soln. or emulsion, *e. g.*, an oil, fat, sol. silicate, soap, dextrin, starch or glue. The products are suitable for use in calico printing or in making lakes.

Dye solution. H. MÜLLER. Can. 257,649, Jan. 26, 1926. An ethylenic glycol is introduced into a dyestuff soln. contg. tannin.

Dyeing solution. H. MÜLLER. Can. 260,686, May 11, 1926. In the manuf. of dyeing and printing solns , ethylene thiodiglycol is introduced into a dyestuff soln. containing a thickening agent and tannin.

Halogenated indigoid dyes. H. STAUDINGER, R. TOBLER, R. STOCKER, J. MÜLLER and A. BUCHER. U. S. 1,600,743, Sept. 21. Dyes forming yellow to orange brown vats dyeing cotton fast tints are prepd. by reacting with 1,2- or 2,3-thionaphthisatins, 1,2- or 2,3-naphththioindoxyls, their halides or anils or halogen substitution products of these compds. or other compds. of similar structure on thionaphthisatins, naphththioindoxyls, acenaphthenequinones or acenaphthenones. Numerous examples are given of dyes producing gray, red, blue, brown and various other shades from the vat after soaping

Dyes of the anthraquinone series. A. H. DAVIES, R. F. THOMPSON and J. THOMAS. U. S. reissue 16,426, Sept. 21. See original pat. No. 1,531,260; *C. A.* **20**, 114.

Azo dyes. M. ISLER and L. VON MECHEL. U. S. 1,600,763, Sept. 21. 3-Hydroxynaphthalene-1,8-dicarboxylic acid is coupled with diazotized aniline, 1-hydroxy-2-aminobenzene-4-sulfo-6-carboxylic acid or other diazo compd. to form dyes which dye animal and vegetable fibers yellow-orange to red, violet, black and brown tints.

Azo dyes. E. B. HIGGINS. U. S. 1,597,791, Aug. 31. Intermediates for making azo dyes are formed by treating the K or Na salt of the anilide of 2,3-hydroxynaphthoic acid or other arylamide of an *o*-carboxy-substituted naphthol or phenol with a substance such as pyridine methyl iodide which causes the labile H of the OH.CO-NHR group to be replaced by the residue of a quarternary NH_4 base.

Azo dyes. J. BADDILEY, J. HILL and A. RILEY. U. S. 1,598,109, Aug. 31. The condensation product of CH_2O and a single primary aromatic amine such as aniline is diazotized and the product is combined with sulfonated azo dye components, *e. g.*, with 1-*p*-sulfophenyl-3-methyl-5-pyrazolone. The products dye wool fast to milling in various shades, including various yellow shades and orange-brown.

Sulfur dyes. M. PALEY. U. S. 1,598,303, Aug. 31. Intermediates such as $NaOC_6H_3(NO_2)_2$ are thionated with flowers of S and Na sulfide.

Dyes containing chromium. F. STRAUB. U. S. 1,598,169, Aug. 31. Azo dyes derived from 3-aminonaphthalene-1,8-dicarboxylic acid, the general formula of which is characterized by the presence of a 1,8-naphthalic acid complex not contg. any OH groups, are treated with oxides, hydroxides or salts of tervalent Cr to produce Cr-contg. products which give yellow to orange, brown, violet or green dyeings. Cf. *C. A.* **20**, 510.

Dyeing mercerized cotton, etc. CHEMICAL WORKS (formerly Sandoz). Brit. 241,854, Oct. 24, 1924. Materials composed of mercerized cotton, cuprammonia-cellulose or viscose "silk" are rendered resistant to direct dyes by treatment, after alkalization, with esterifying agents such as aromatic carboxy or sulfo acid chlorides or anhydrides. The treated products still have affinity for basic, acid, Cr-mordant

dyes and gallocyanine derivs. Alc., NaOH and pyridine may be used followed by treatment with *o*- or *p*-toluenesulfochloride or benzoyl chloride.

Dyeing cellulose acetate. G. H. ELLIS, F. M. STEVENSON and C. M. CROFT. U. S. 1,600,277, Sept. 21. Nonsulfonated derivs. of the pyrazolone series, *e. g.*, benzeneazo-1-phenyl-3-methyl-5-pyrazolone, are used for dyeing.

Dyeing cellulose ethers. H. EICHWEDE and E. FISCHER. U. S. 1,599,748, Sept. 14. Monoazo dyes are used such as those formed from 3-nitro-2-methyl-1-aminobenzene and diethylaniline-*m*-sulfonic acid or similar compds.

Dyeing. H. KRZIKALLA and K. SCHNITZSPAHN. Can 260,453, May 4, 1926. A compn. comprises a mixt of an acid salt of a diazotizable aromatic amide and an acid in a dry state, a solid nitrite in about equimol proportions and a water-sol. neutral salt in a dry condition.

Apparatus for dyeing textile materials. W. E. H. BELL. U. S. 1,600,574, Sept. 21.

Apparatus for dyeing textile fabrics. U. BAUMANN, JR. U. S. 1,598,418, Aug. 31.

Two-tone cloud dyeing of textile fabrics. P. MIJER. U. S. 1,599,910, Sept. 14.

Silk. H. DREYFUS. Can. 260,319, Apr. 27, 1926. Materials composed wholly or partly of cellulose acetate are treated with hot or boiling aq. liquors, to which has been added in sufficient quantity a protecting agent to preserve the luster, transparency and appearance of the cellulose acetate.

Artificial silk. C. C. JESSEN. U. S. 1,597,684, Aug. 31. Strands of spun and twisted threads are wound, directly from the centrifuge pot, after the latter has been removed from a spinning machine, upon a freely removable cylinder while rotating the latter in the presence of a bath such as dil H_2SO_4 for chem. treatment of the strands The cylinder, with the material wound on it, is then subjected to washing and drying operations

Solution for making silk. J. C. HARTOGS. Can. 272,711, July 20, 1926. A soln for use in prepg artificial silk or the like contains a K cellulose xanthate and a K soap.

Cotton and silk manufacture. G. TAGLIANI. Can. 262,403, July 6, 1926. Alkali and acid mercerized cotton, NH_4 cuproxide cellulose, xanthogenate cellulose, etc., are rendered refractory against further absorption of direct dyes by treating, after previous alkalinization, with suitable esterifying agents

Spinning box for rayon silk. C. A. HUTTINGER U. S. 1,598,281, Aug. 31.

Apparatus for spinning artificial silk. F. SEIBEL. U. S. 1,598,157, Aug. 31.

Cotton fabric. E. D. WALEN, *et al.* Can. 262,038, June 22, 1926. The compn. comprises approx. 4 parts Na silicate, 3 parts sol. oil and 18 parts water

Vegetable textile. L LILIENFELD. Can. 259,929, Apr. 20, 1926. Vegetable textile fibrous material is improved by treating it with an alk. soln. and then with a monohalogen deriv. of a fatty acid in the presence of at least a part of the alk. soln

Removing fats and waxes from textile materials. R. A. PHAIR. U. S 1,598,305, Aug. 31. Textile materials are boiled in an alk. soln. contg Mg oleate.

Greasing textile fibers. P. M. SPIESS. U. S. 1,598,402, Aug 31. Textile fibers are treated with a synthetic ester of a monovalent alc and a fatty acid, *e. g.*, with the Et ester of the fatty acid of coconut oil.

Preparing fur for shrinking and felting. J. H. MARTIN. U. S. 1,597,992, Aug. 31. Fur is treated with Na orthoborate or other alkali metal orthoborate.

Pile fabrics or felt. DURATEX CORPORATION. Brit. 241,570, Oct. 16, 1924. Projecting fibers are fixed by rubber cement, pyroxylin or oxidized oil and mech. treated to form a pile surface. A cellulose ester compn. such as used for artificial leather may be applied and the material may be calendered and further coated or may be treated with Al acetate.

Treating fabrics to facilitate molding or shaping. R. F. BACON and C. H. KIDWELL. U. S. reissue 16,423, Sept. 21. See original pat. No. 1,509,920; *C. A.* **18**, 3727.

Cellulose thread, etc. W. H. GLOVER. Can. 261,967, June 22, 1926. A cellulose ether soln. is introduced into a setting bath which comprises a saponifiable oil to effect the pptn. of the cellulose ether.

Cellulose acetate marking process. G. H. ELLIS, F. M. STEVENSON and C. M. CROFT. Can. 260,530, May 4, 1926. In the process for dyeing, printing or stencilling of products made of or contg. cellulose acetate, the dyeing or coloring is effected wholly or partly by means of non-sulfonated derivs. of the pyrazolone series, and in particular by means of non-sulfonated azo derivs. of pyrazolone compds.

Parchment or pattern effects, etc. on cellulosic fabrics, yarns or fibers. KNOW MILL PRINTING CO., LTD., T L. MORT and F. W. WEEKS. Brit. 241,246, May 20, 1924. The rapidity of action of H_2SO_4 on cellulosic materials is reduced, without

decreasing its effectiveness, by using it together with MeOH, acetone, HOAc or their homologs which are miscible with the acid.

Filaments, films, etc. from cellulose ethers. W. H. Glover. U. S. 1,599,230, Sept. 7. A soln. of cellulose ethyl ether or other cellulose ether soln. is introduced into a setting bath comprising castor oil or other saponifiable oil which serves to produce a uniform pliable product.

Threads, films, etc. from cellulose esters. H. J. Hegan. U. S. 1,599,233, Sept. 7. A soln. of cellulose acetate or other cellulose ester is projected into a coagulating bath contg. a fatty acid such as oleic acid and castor and olive oils which serves to produce a product of good pliability.

Artificial thread. J. C. Hartogs. Can. 262,818, July 20, 1926 In the process of spinning viscose, a ferric salt is added to an acid-spinning bath to prevent evolution of H_2S.

Treating cotton or other threads containing cellulose. G. Tagliani. Can. 258,637, Mar 2, 1926. Cotton or other fibers contg. cellulose are rendered indifferent to substantive dyes by treating the alkalized cellulose material which is preliminarily dyed with direct colors with *p*-toluenesulfonyl chloride.

Substitute for gut. N. B. Maurice and W. Frost. U. S. 1,597,860, Aug. 31. Threads of natural silk are treated with a soln. of a gelatinous substance such as gelatin and rubber latex, twisted together while the soln. is moist and rendered waterproof, *e. g.*, by treatment with CH_2O or chrome alum. Cf *C. A.* **19**, 1331.

Fabric washing composition. C B. Hager. Can. 260,375, May 4, 1926. A fabric washing compn. is composed of pulverized fire clay 55%, Na_2CO_3 25% and NaCl 20%.

Electric vibrator apparatus for testing textile and similar materials. J. E. G. Lahousse. U. S. 1,598,141, Aug 31.

26—PAINTS, VARNISHES AND RESINS

A. H. SABIN

Traffic paint. H A. Nelson and S. Werthan. *Ind Eng. Chem.* **18**, 965–70 (1926).—The properties, most important for paints for marking traffic lines and directions on surfaces, considered in more or less detail are: consistency, drying, hiding power, color and color retention, visibility (day and night), and durability (resistance to weather and abrasion). Means of formulating and testing of this type of paint are indicated. W. H. Boynton

Influence of number and size of particles on the covering power [of pigments]. C. Kuehn. *Farben-Ztg.* **31**, 1131 3(1926).—The relative opacities of unit vols. of suspensions of burnt sienna in boiled linseed oil were detd. by viewing under a low-power microscope illuminated by diffused candle light, and noting the opacity values of smoke-glass oculars necessary to obtain complete extinction of the light transmitted. It was found that the opacities were proportional to the no. of particles per unit vol. of suspension, further tests confirming the fact that the relative dimensions of the particles (between the limits of 159 and 283 sq. cm. sp. surface examd.) did not affect the opacities. The relationship between sp. surface and opacity is similarly linear, but the rate of increase of opacity with increase in the no of particles per unit vol. of suspension increases more rapidly with the finer particles (*C. A.* **14**, 3160). B. C. A.

Colloid chemistry and printing. O. Treichel. *Kolloid-Z.* **38**, 80–1(1926).—The principles underlying various printing processes are described. B. C. A.

Barium sulfate [heavy spar and blanc fixe]. C. P. van Hoek. *Farben-Ztg.* **31**, 1136–7(1926).—The undesirable properties conferred on a paint by the presence of Ba sulfate in the form of heavy spar or *blanc fixe* finds a parallel in rubber mixes. The presence of an adsorbed layer of air on the particles inhibits adequate adhesion to the oil medium in paints and is suggested as being the cause of the low opacity and the weakening of paint films. B. C. A.

Rosin obtained from Bukovina firs. O. Czerny. *Bul. soc. chim. România* **6**, 94–6(1924).—This rosin (cf. *C. A.* **19**, 1772) contains 88.5% of acids and 4.6% of unsaponifiable residue, the deficit, 6.9%, being, according to Fahrion, hydroxy acids; α-, β- and γ-abietic, sylvic, and γ-pinic acids are present. B. C. A.

Cellulose ester compositions [for making varnishes] (U. S. pat. 1,600,700) **23.**
Apparatus for drying and heating "lithopone green cake" (U. S. pat. 1,599,467) **1.**

NASKE, C.: **Zerkleinerungs-vorrichtungen und Mahlanlagen.** 4th ed. enlarged. Edited by A. Binz. Leipzig: Otto Spamer. 375 pp. R. M. 33, bound R. M. 36.

RIZZINI, ETTORE: **L'industria dei colori e delli vernici.** 2nd ed., revised and enlarged. Milan: Ulrico Hoepli, Editore Libraio della Real Casa. 782 pp. 42 lire. Reviewed in *Chem. Trade J.* **79**, 281(1926).

Paint finishes. C. H. EGELHOFF. U. S. 1,600,723, Sept. 21. Surfaces such as interior walls are given 2 coatings, the under coating being of slower drying compn. than the outer coating. The under coating may comprise benzine 50, linseed oil 9, oyster shell 1 and rosin 40%, and the outer coating MeOH 8 oz., denatured EtOH 8 oz., benzine 1/2 oz and white lead 3.94 lbs.

Decorative painting. W. WHYTE. U. S. 1,600,156, Sept. 14. See Brit. 225,001 (*C. A.* **19**, 1955).

White lead. G. F. LLOYD and F. H. CAMPBELL. Brit. 241,329, Aug. 8, 1924. A highly basic Pb sulfate is treated with an aq. soln. of an alkali metal bicarbonate which may contain undissolved carbonate. The basic Pb sulfate may be prepd. by treating PbO with H_2SO_4 (or with $NaHSO_4$ or $KHSO_4$) in the presence of a small quantity of HOAc or HNO_3.

Zinc oxide. W. WHYTE. Can. 259,157, Mar. 23, 1926. A sepg. paint consists of the following ingredients in the following approx. proportions: Paris white 80–100, stucco 4–6, lithopone 7–9, gums 608, cream of tartar $1^1/_2$ and water $12^1/_2$ lbs. incorporated with ZnO $5^1/_2$, Dutch stand oil $5^1/_2$, paraffin oil 2, boiled linseed oil $2^1/_2$ lbs. and a drying agent.

Oxidation of siccative oils. F. FRAUNBERGER and G. KNOFFLER. Can. 260,075, Apr. 27, 1926 Siccative oils are mixed with solns. of org. substances, which do not dissolve the oils, prior to the oxidation process, during which the oils are kept in a finely divided state by the said solns.

Oil. A. SCHWARCMAN. Can. 263,042, July 27, 1926. A drier for linseed oil comprises a substantially neutral mixt. of linseed oil and a soap of the acids of linseed oil with a catalytic metal, the oil forming about half the mixt.

Lithopone. FARBENFABRIKEN VORM. F. BAYER & CO. Brit. 241,795, March 27, 1925. Combustion gases such as those obtained by burning water gas with air, substantially free from O and dust and at a temp. slightly higher than that to which lithopone is to be heated, are used to heat lithopone in a rotary furnace, to a definite end temp. before being plunged into cold H_2O.

Lithopone. W. J. O'BRIEN. U. S. 1,600,772, Sept. 21. The covering capacity and weather-resisting qualities of lithopone are increased by admixt. with a Ti oxide. U. S. 1,600,773 specifies subjecting a $ZnSO_4$ soln. to the action of a Ba sulfide soln. in the presence of Ti oxide.

Linoxyn-like substance. W. O. HERRMANN and H. DEUTSCH. Can. 259,177, Mar. 23, 1926 Non-phenolic aldehyde resins are heated with pretreated org. hydroxy acid compds , a filling material, another resin, and a softening material are incorporated and the desired article is formed by hot pressing.

Varnish. H. W. MATHESON. Can. 262,391, July 6, 1926. A compn. for use as a varnish, cement or the like comprises an acetylene-phenol-aldehyde resinous body and a solvent.

Varnish oil. A. SCHWARCMAN. Can. 263,041, July 27, 1926. Raw linseed oil is improved for varnish making processes by agitating it with freshly pptd. hydrated ZnO, the oxide being in amts. not greater than 0.1%.

Thermoplastic compositions. T. HOUGH. Brit. 241,807, Apr. 20, 1925. An ingredient of compns. for hot press molding is prepd. by mixing 2 or more copals, gums, and resins with shellac and heating the mixt. under pressure to 200–350° for 30–60 min. Kauri copal 40, Dammar 20, resin 25 and shellac 15 parts may be used, with various fillers or coloring substances.

Rosin. H. S. MILLS. Can. 260,274, Apr. 27, 1926. A rosin compd. is prepd. by dissolving rosin and gum sandarack in a volatile solvent, the rosin constituting at least 80% of the mixt ; the solvent is distd. and the compd. boiled in the presence of a small percentage of linseed oil.

Resinous composition. L. V. ADAMS. Can. 262,979, July 27, 1926. A resin comprising glycerol and phthalic anhydride is blended with a drying oil by heating these materials with benzyl benzoate to a temp. sufficiently high to cause dispersion of the former compds. in the latter compd.

Resinous product. J. G. E. WRIGHT and W. J. BARTLETT. Can. 262,399, July 6, 1926. A resin, comprising a compd. of glycerol and phthalic anhydride in the

fusible stage, is heated while dispersed in a liquid capable of being heated to a temp. sufficiently high partially to cure the resin, and the resin is pptd. from soln. before the curing is complete. Cf. *C. A.* **20**, 1913.

Artificial resin. A. REGAL. Can. 262,136, June 29, 1926. Phenols are condensed with CH_2O by using decompn. products of ozonides as a condensing agent.

Artificial resin. A. REGAL. Can. 262,135, June 29, 1926. Phenols are condensed with CH_2O at an elevated temp. in the presence of products of addn. formed by allowing CH_2O to act on an aromatic amino compd., the H atoms of which are replaced by org. radicals.

Artificial resin. R. SINGER. Can. 262,194, June 29, 1926. Phenols and CH_2O are condensed by using chloroaminoaldehydes as condensing agents.

Artificial resin. A. REGAL. Can. 262,930, July 27, 1926. Phenols are reacted on with CH_2O at an elevated temp. in the presence of an indophenolic compd., formed by adding a small quantity of a *p*-aminoaryl compd. and followed by a moderate oxidation.

Artificial resins from aliphatic aldehydes. W. O. HERRMANN and H. DEUTSCH. U. S. 1,600,113, Sept. 14 Acetaldehyde, crotonaldehyde, butyraldehyde or other similar aldehydes are subjected to long-continued action of inorg. substances giving H ions in aq soln , *e. g.*, H_2SO_4, HCl, HOAc or $NaHSO_4$.

Phenolic condensation product. L. V. REDMAN. Can. 261,954, June 22, 1926. A potentially reactive compn. comprises a phenolic resin, an aq. alk. solvent, and an aldehyde body capable of functioning both as a diluent for the soln. and as a hardening agent for the resin.

Resinous condensation products from acetaldehyde. L. H. BAEKELAND and A. H. GOTTHELF. U. S. 1,598,546, Aug. 31. Infusible condensation products are obtained by the reaction of $(CH_2)_6N_4$ or other substance contg. an active CH_2 group upon a condensation product of a phenol and acetaldehyde. (The application upon which this pat. was issued was filed Dec. 19, 1919)

Phenol methylal resins. C. B. CARTER and A. E. COXE. Can. 258,609, Mar. 2, 1926 A phenolic condensation product is produced by subjecting to heat and pressure a phenolic body and a methylal in the presence of water and a small percentage of acid; the phenolic body is taken in excess of an equimol. proportion and the reaction carried on until all of the methylal is combined with the phenolic body.

Lacquer enamel. S. D. SHIPLEY and G. C. GIVEN. Can. 262,784, July 20, 1926. A varnish comprises nitrocellulose, Et glycol, a benzene hydrocarbon and a cyclic alc.

Superficially impregnating ebonite with Japan lacquer. R. NAMIKI. U. S. 1,600,293, Sept. 21.

27—FATS, FATTY OILS, WAXES AND SOAPS

E. SCHERUBEL

Refractometric determination of fat in oil seeds and cake. HERMANN ZANDER. *Z. Untersuch. Lebensm.* **51**, 324–35(1926).—Z. applies Wesson's method as a rapid means for fat detn. in linseed. Two g. of finely ground seed is placed in a mortar which has previously been warmed to 70°, and triturated for 2 min. with 4 cc. of $C_{10}H_7Cl$. After filtering, the % of oil is detd. from the *n* of the soln. A detn. can be completed in 12 min. with an accuracy as great as that by the ordinary extn. method. W. J. HUSA

A new reagent for sulfur olive oil (olive cake oil). F. CANZONERI. *Ann. chim. applicata* **16**, 217–9(1926).—Expts. show that the reaction of Saccardi (*C. A.* **20**, 3243) for olive cake oil is a delicate test for CS_2 and for oils contg. CS_2, but that oil after long standing and which contains no CS_2 does not give a positive test. Since olive cake oil added to higher grade olive oil may have previously been refined, the Saccardi test does not aid in detecting such adulteration. The method recommended earlier by C. and Bianchini (*Ann. chim. applicata* **2**, 1(1914)) on the other hand gives a positive test for cake oil in mixts., whether the oil is crude or refined and whether or not CS_2 is still present. The reaction of Saccardi probably involves the formation of CS(SK)OEt, for expts. proved that alc. KOH, Pb salts and CS_2 first form CS(SK)OEt and then $Pb(SCSOEt)_2$ thus: $2CS(SK)OEt + Pb(NO_3)_2 \longrightarrow Pb(SCSOEt)_2 + 2KNO_3$. On heating with alc. KOH, $Pb(SCSOEt)_2$ blackens rapidly, probably forming PbS. With excess of CS_2, however, a *red salt* instead of $Pb(SCSOEt)_2$ is obtained, the compn. of which is to be studied. These reactions indicate the mechanism of the Saccardi test,

which is further confirmed by the fact that a positive test is obtained on addn. of alc. KOH to oil contg. $Pb(SCSOEt)_2$. C. C. DAVIS

New plant for fat extraction by solvents. L. J. SIMON AND J. W. HINCHLEY. *J. Soc. Chem. Ind.* **45,** 252–9T(1926).—In the design of the plant described there is never more than 4 cwt. in the plant at one time; and the extn. time is approx. 30 min. while the steaming of the meal to free it from solvent is 4 to 6 min. This is made possible by pre-heating the meal nearly to steam temp. and also by the fact that the steam has only to pass through a few in. of material All meal is in contact with the solvent for the same time. The distn. of the oil soln. takes place continuously and only well-satd. solvent enters the stills. The operation is conducted in a rotating cage, consisting of a perforated drum, carried on a hollow shaft through which the solvent and steam enter. The meal is charged into the cage by the removal of one of the end plates and the cage is inserted into a cylinder carrying the gear for rotating it. Each machine carries 3 separately operated cages; automatic hydraulic valves are operated by means of a timed cam shaft On the operation of the cam shaft the cage rotates and a satd. soln. of fat No. 3 enters the cylinder of the cage and the soln. obtained runs off for distn. Soln. No. 2 now enters the slowly rotating cage and is run off into soln. tank No. 2. At this point the speed of the cage is raised and clean solvent enters and is run off into tank No 1. This is the final flush. Steam is now admitted into the closed coils in the cylinder and the temp. of the meal raised. Direct steam is then admitted through the center of the basket for 4 to 6 min The operation of the machine may be divided into 7 stages: (1) preliminary treatment of the dried meal with solvent vapor, (2) a washing of the material with a strong soln. of oil and solvent to obtain a strong soln. for distn., (3) a 2nd treatment with soln. which is used for the next charge for operation 2, (4) a 3rd treatment which is used for the next charge for operation 3, (5) a final treatment with pure solvent, (6) a drying period in which liquid solvent is expelled from the meal by centripetal force, the material being warmed by indirect steam, (7) steaming off with direct steam to remove the last traces of solvent from the meal. During the periods 1 to 5 the cage rotates at a low speed, which is sufficient to keep the meal in a const. state of agitation During the periods 6 to 7 the speed of the cage is increased so as to form the meal into a cylinder with a wall of even thickness and texture. Since the steam is compelled to pass through an even wall of meal of small thickness the removal of the last traces of the solvent is performed in a very short time; and the hot solvent is at once available for reuse E. SCHERUBEL

Use of pressure screw for the extraction of palm oil. HOUARD, LAVERGNE AND CASTELLI. *Bull mat grasses inst colonial Marseille* **1926,** 111–6 —This is a discussion of tests using a screw press The advantages are simplicity of operation, better yield and better quality of oil E. SCHERUBEL

Chemical study of the fruits of Elaeis guineënsis. F. M. DYKE AND F. O. JAMES. *Bull. mat. grasses inst colonial Marseille* **1926,** 147–57.—A method is described for detg. the oil content of palm oil fruits of the Belgian Congo with reasonable exactness and with less time and material than with the use of ordinary solvents. It is based upon the fact that during the ripening of the fruit the oil content and the non-oleaginous solids remain the same When the relation between the non-oleaginous solids and the total pericarp has been detd it is simple to det. the H_2O and oil by difference. The method is as follows: Weigh the sample of fruit, sep. the pericarp and weigh. Then dry and weigh again. The % of pericarp and H_2O is thus obtained. The % of non-oleaginous solids is obtained from a table, and the % of oil obtained by difference. E. SCHERUBEL

Saturated acids of highest melting point from peanut oil. D. HOLDE AND N. N. GODBOLE. *Z. deut. Oel-Fett-Ind.* **46,** 129–32, 145–8, 163–5, 179–81(1926).—Four kg. of the first pressing of an East Indian peanut oil was used in the investigation; it had the following consts.: d_4^{15} 0.918, n_D^{13} 1 4708, sapon. no. 185.3, I no. 93.2 (Hanus), acid no. 5, unsapon. 0 96% The fatty acids were isolated, crystd. from acetone (yield 292.2 g.), then from 90–96% alc. (yield 82.5 g.) and finally distd. in small lots under 1.0–1.1 mm. at 238–275°. The distillates and residues were separately examd. Two residues of 1.8 and 0.9 g. were dissolved in C_6H_6, bleached with animal C, crystd. from acetone and glacial AcOH, converted into K salts, extd. with benzine and the fatty acids again liberated and crystd. from glacial AcOH (yield 1.3 g.): they showed a m. p. of 77.5–80.0° and had a mol. wt of 391 5 (by titration); this proves the acid to be hexacosanic acid $C_{26}H_{52}O_2$ (calcd mol wt 396). This acid gave by fractional crystn. from C_6H_6 followed by fractional pptn. with Li acetate from alc. $CHCl_3$ soln. (1:1) fractions with a m. p. of 78 7–79.0° and a mol. wt. of 390–394, confirming the identity of hexacosanic acid. The estd. total quantity of this acid in the original peanut oil is 0.1–0.2%. The distillates from vacuum distn were used for the isolation of lignoceric acid by conversion

into Me esters and by repeated vacuum distn. under 0.5–0.8 mm. by sapon. of the highest crystn. and by fractional pptn. with Li acetate: the mol. wts. decreased in this case from 376 to 370 while the m. p. increased from 79.5° to 81.0°, indicating lignoceric acid with small quantities of hexaconic acid as impurity. P. ESCHER

Perilla. ANON. *Bull. Imp. Inst.* **24,** 205–8(1926).—Results are tabulated of the analysis of perilla seed grown experimentally in the Union of S. Africa, Southern Rhodesia, India and Hong Kong, and of the oils obtained from the resp. seeds. All the seeds gave a satisfactory yield of oil, and the consts. of the oils comply with the tentative standard of the Am. Soc. for Testing Materials, except that in all cases but one the I no. (*via* Hubl) was somewhat low, and that in 2 cases the acid value was much higher than the max. permitted. A. PAPINEAU-COUTURE

Chinese wood oil. W. NAGEL AND J. GRÜSS. *Wiss. Veroff. Siemens-Konzern* **4,** 284–320(1925); *Brit. Chem Abstracts* **1926A,** 498–9; cf. *C. A.* **20,** 1144.—The following derivs. of α-eleostearic acid are described: K, Na and Cu salts; Me ester b_{12} 214° (with conversion to the β isomeride), viscosity 0.109 (compared to 2.019 for tung oil), obtained from CH_2N_2 and the acid or from KOH in MeOH and tung oil; Et and isoamyl esters prepd. similarly, $b_{17.5}$ 229–32° and b_{40-70} 260 80° (decompn.), resp.; glycol ester, decompn. on distn., obtained from glycol and the acid at 180–200°. The following derivs. of β-eleostearic acid are described: amide, m. 111–2°; hydrazide, m. 128–9°, obtained from the Me ester; Et ester b_{16} 225–40°. A W. FRANCIS

Chinese wood oil. II. Eleostearic acid. K. H. BAUER. *Chem. Umschau Fette, Oele, Wachse u. Harze* **33,** 53–6(1926)—Pure α-eleostearic acid was heated to 200° in an atm. of CO_2 and the escaping vapors were absorbed in H_2SO_4. The pure acid had acid no. 200 4, sapon. no. 200.4 and I no. 181.2. After heating, the acid no. fell to 152.4, the sapon. no. increased to 206.3, while the I no. fell to 88 7 in one expt., and to 176, 213 8 and 85.4, resp., in another; the total loss by vaporization was 10.6% after 19 hrs in the first expt. and 13 8 after 36 hrs. in the second expt. Pure β-eleostearic acid was similarly heated in CO_2, the product showing an acid no. of 145.1, sapon no. of 235 8, and an I no. of 79 1 in one case, and 163.6, 247 6 and 92 6, resp, in another. These results indicate anhydride formation since acid no. and sapon. no. do not go parallel. The vapors absorbed by H_2SO_4 were extd. with ether and the united product of 4 expts. showed an I no. of 14 9 and 15.2; apparently a cracking of the eleostearic acid had occurred with formation of H_2O and unsatd. compds. The increased sapon. no of the heated acids suggests splitting into compds. of smaller mol. wt; the mol. wt. of the polymerized β acid in C_6H_6 soln. was 4633 and 4588.2, by the Rast camphor method 2285.6; the mol. wt of the polymerized α acid in C_6H_6 soln. was 985.6 and by the Rast camphor method 490 9. Attempts to sep. the polymerized products into a sol. and an insol portion by means of solvents, or into a free acid and sapon. compds. by means of K_2CO_3, were unsuccessful Hydrogenation of the polymerized α acid in alc. soln at room temp. and 45 lb pressure yielded mainly stearic acid. P. E.

Glycerol distillation. II. Wood glycerol refining plant. E. T. WEBB. *Perfumery Essential Oil Record* **17,** 379–82(1926).—This is a description with diagram of the Wood plant, which is designed to make refined glycerol with reduced fuel consumption. The principal savings are effected as follows: (1) The amt. of distn. steam used is reduced; (2) less sweet water is made, (3) a large proportion of the sensible heat and all of the latent heat of the condensed glycerol is recovered; (4) the relatively small high temp. areas reduce radiation losses; (5) only one vacuum pump is employed for evapn. and distn.; (6) less cooling H_2O is required on stills and evaporator. The plant is capable of distg. crude at 25 to 30% of the fuel cost of the Rhebeke. E. S.

Purification of glycerol lyes. O HAUSAMANN. *Chem.-Ztg.* **50,** 369–71(1926).—This is a discussion of the lime purification process. E. SCHERUBEL

The bleaching of hard and soft soaps. KARL BRAUN AND HANS NAST. *Seifensieder-Ztg.* **53,** 431–3, 450–1(1926); cf. *C. A.* **19,** 411.—The following tests were made, 100 kg. of brown waste fat from cooking being used for each one. 100 g. Blankit was crutched into the soap Bleaching resulted, but the color began to revert in 24 hrs. and in 4 weeks was back to the original. Soap was boiled with 500 g. Peroxol (K persulfate) for 45 min. The effect was the same as with Blankit and the final result also the same. In a similar test boiling the soap for 4 hrs. produced a light yellow color which was permanent. Soap contg. 10% rosin bleached with 500 g. Peroxol and 50 g. ZnO was of light yellow color and did not darken. Soap was bleached with 250 g. Peroxol and 100 g. Na_2O_2 and a good color obtained. A similar test with 500 g. Peroxol and 30 g. Blankit showed a slightly better result after the addn. of the Blankit. By using 30 g. Blankit first, followed by 500 g. Peroxol a result was obtained which was the same as for 500 g. Peroxol alone. Adding 100 g. Peroxol to soap which had been salted out 6 hrs. pre-

viously also gave a good bleach. Adding 10% NaClO soln. did not give as good a result as did Peroxol. Soap contg. 10% rosin bleached with 100 g. Peroxol and 50 g. MnO gave as good a result as when 500 g. Peroxol was used. Soft soap tests with 100 kg. of fat were made as follows: green linseed oil soap was bleached with 100 g. Blankit. The color was modified. Similar soap bleached with 500 g. and 150 g. of Peroxol, resp., resulted in a change from green to light yellow. Another test with 500 g. Peroxol and 100 g. Na_2O_2 did not give any better results than when Peroxol alone was used. Soap made from a low-grade linseed oil contg. 40% free fatty acids was bleached with 500 g. Blankit and also with 500 g. Peroxol; the former was unaffected while the latter gave a smooth green soap of good appearance. In general oxidizing bleaches work best on brown tallow and do not give good results on yellow tallow. Soaps contg. rosin are best handled with a reducing bleach or an oxidizing bleach plus ZnO. E. SCHERUBEL

Air humidity and the drying of soap. E. L. LEDERER. *Z. deut. Öl- Fett-Ind.* **46,** 519–21(1926).—L.'s "permanation const." depends upon the total pressures under which the system exists, and this again, as shown by expt., is proportional to the degree of swelling. Because of the lack of complete exptl. data, the calcns. are based upon available data for Na stearate, but a fair agreement was found with exptl. results on com. soaps. Data for 100% humidity, maintained for several weeks, are difficult to obtain. The equil. when no H_2O is lost and none is absorbed lies for milled soaps with 80% fatty acids and 130 g. H_2O per kg. soap at about 87% humidity, for grained soap of 66% fatty acids and 280 g. H_2O at 96.4%, and for 60% fatty acids and 345 g. H_2O at 97.6% humidity. An example is given for calcg. the loss in wt. of a sphere of soap of 27 mm. radius (85 g.) and 289 g. H_2O per kg. after 10, 20 and 30 days storage at 30% humidity, the exptl. results, which agree well with the calcd. ones, follow: humidity at 30%, after 10 days 5.691 g. loss, 20 days 7.801 g., and 30 days 9.371 g. P. ESCHER

Manufacture of toilet soaps. A. P. SACHS. *J. Oil Fat Ind.* **3,** 321–7(1926).—The chemistry of soap production as related to the physics of the various reactions and purification steps is discussed. Particular stress is laid on the mechanical operations which det. the physical condition of the soap. A. P. SACHS

Fatty acids in pine oil (HASSELSTROEM) **23.** Adsorptive agent for purifying oils (U. S. pat. 1,598,256) **18.** Revivifying spent filtering materials (U. S. pat. 1,598,967) **18.**

Extracting fats. CHEMICAL ENGINEERING CO. (Manchester), LTD., J. W. SPENSLEY and J. W. BATTERSBY. Brit. 241,804, July 16, 1924. Normally solid fats are sepd. from fatty animal tissue such as beef kel, mutton kel, or pig leaf by a beating action followed by heating to above the m. p. of the fat being extd. but below the temp. at which the gelatin contained in the residual fiber would be deleteriously affected. The long fiber is treated with cold H_2O contg. 2% of lime and then boiled with H_2O or steam to sep. out the gelatin. An app. is described.

Extracting oil from blubber, etc. CHEMICAL ENGINEERING CO. (Manchester), LTD., J. W. SPENSLEY and J. W. BATTERSBY. Brit. 241,276, July 16, 1924.

Degreasing raw wool. A. M. BRUCKHOFF. Brit. 241,314, July 28, 1924. Raw wool, preferably dried until it contains about 2–3% H_2O, is degreased by treating it with liquid acetone, leaving 2–5% of fat in the wool.

Extracting palm oil by use of steam cooking, etc. T. DICKINSON, F. J. BRIMLEY and NIGERIAN PRODUCTS. Brit. 241,297, July 21, 1924. An app. is described.

Digester and agitator for treating palm fruit to soften and remove its fibrous covering, etc. C. DOWNS and R. A. BELLWOOD. Brit. 241,298. July 22, 1924.

Apparatus for hydrogenating oils. E. L. ANDERSON. U. S. 1,599,629, Sept. 14.

Soap. R. E. DIVINE. Brit. 241,734, Nov. 18, 1924. Decompn. and discoloration of soap is prevented by mixing with the molten soap 0.05–1.0% of aniline, α-naphthylamine, *p*-phenylenediamine, diphenylamine or other org. amine having a "residual H atom." Cf. *C. A.* **19,** 2421.

28—SUGAR, STARCH AND GUMS

F. W. ZERBAN

Production of refined sugar from gur in British India in 1924-5. J. v. H. *Arch. Suikerind.* **34,** 659–61(1926).—Statistics collected by the Sugar Bureau at Pusa, of quantities produced and of prices, for 1923/4 and 1924/5. F. W. ZERBAN

Improvements in clarification. PH. VAN HARREVELD. *Arch. Suikerind.* **34,** 593–602(1926).—The well-known advantages and disadvantages of defecation, sulfitation and carbonatation are discussed. The factory control results (Java) for 1924 and 1925 are tabulated, grouped according to the clarification method and the purity of the raw juice. The results clearly show that carbonatation removes the largest % of non-sugars, followed by defecation and then sulfitation. Carbonatation gives the smallest quantity of molasses, and this has the lowest purity (sucrose/Brix); the loss in press cake is lowest, because the cake is easier to wash; the undetd. losses are also the smallest. The total sucrose not recovered in carbonatation factories was 7.9% on polarization in cane in 1924, and 7.6% in 1925; for sulfitation factories it was 10.4 and 10.1%, resp. The figures for defecation factories are midway between the other 2 groups. The reason why in spite of these facts, carbonatation factories are not more numerous in Java, is the high cost of limestone and coke. It is hoped that the improvements in defecation-sulfitation tried at Peterongan and Djatiroto (*C. A.* **20,** 2914) will finally lead to practical results F. W. ZERBAN

Deterioration of cane in the factory yard. F. HOMMES. *Arch. Suikerind.* **34,** 545–51(1926); cf. *C. A.* **20,** 1918.—To investigate the effect of storing cut cane under different conditions, preliminary tests were made in 1924 with variety EK 2, and they showed that this cane kept better in the shade than in the sun. In the 1925 expts. the sample loads were divided into 4 lots, 2 of which were ground as soon as possible, while the other 2 were kept for 24 hrs. longer, one in the sun and the other in the shade. The results of the analyses are tabulated. The figures for the 2 check lots were averaged, as they showed very close agreement, proving again the superiority of the new method of sampling. The stored samples in the case of some varieties kept better in the shade, but others when placed in the sun. If further tests confirm these results, they will furnish a valuable guide in deciding what varieties should be ground first. F W. Z.

The Boulogne juice weigher. C. N. J. LEON. *Arch. Suikerind.* **34,** 626–38 (1926).—This app , described in detail and illustrated by diagrams and photographs is entirely automatic. The wt.-recording instruments can be placed at any desired point. The sensitivity is 1 kg. per load of 5560 kg. It requires less space than any other juice scale, and very little attention. F. W. ZERBAN

Beet sugar manufacture. J. KWANTES. *Chemistry & Industry* **45,** 638–45(1926).—A general descriptive article, with diagrams and photographs. F. W. ZERBAN

Electrification of sugar factories. *Proc. 4th Ann. Congr. S. African Sugar Assoc.* **1926,** 5–18.—A committee rept. E. J. C.

The Lafeuille crystallizer. Reply to the report by G. E. van Nes and V. Khainovsky on tests at Peterongan. E. VONCK. *Arch. Suikerind.* **34,** 576–86(1926); cf. *C. A.* **20,** 2088.—The Lafeuille crystallizer was not used by v. N. and K. as intended, and the results, therefore, do not justify the conclusions. F. W. ZERBAN

The Lafeuille crystallizer. G. E. VAN NES. *Arch. Suikerind.* **34,** 586–9(1926); cf. Vonck, preceding abstr.—Refutation of V.'s criticisms. F. W. ZERBAN

Juice strainer carriers. C. N. J. LEON. *Arch. Suikerind.* **34,** 602–9(1926).—Detailed description, with drawing, of a mech. screen carrier. F. W. ZERBAN

System of mill control. PH. VAN HARREVELD. *Arch. Suikerind.* **34,** 552–62(1926); cf. *C. A.* **19,** 3169.—Directions for carrying out this control, and copies of blanks to be filled in. F. W. ZERBAN

System of fuel control. PH. VAN HARREVELD. *Arch. Suikerind.* **34,** 563–9(1926); cf. *C. A.* **19,** 3169 and preceding abstr.—Similar instructions and blanks. F. W. Z.

The borer pest (in Java) VI. J. POLL. *Arch. Suikerind.* **34,** 610–4(1926); cf. *C. A.* **20,** 1919. F. W. ZERBAN

Starch grains of wheat considered as partially dehydrated amylose (BAKHUYZEN) **11D.** Sugar beet experiments (ANON) **15.** Revivifying spent filtering materials (U. S. pat. 1,598,967) **18.**

Wood sugar. E. FÄRBER. U. S. 1,599,462, Sept. 14. In the production of a pure, fermentable and crystallizable sugar from "wood sugar," a finely subdivided alk. earth oxide such as CaO is introduced into a strong raw-sugar soln., the resulting sugar alk. earth compds. are sepd. and then treated with acid to liberate polysaccharides and the sugar soln. thus purified is hydrolyzed.

Apparatus for sterilizing sugar juices. N. CAPAY. U. S. 1,600,093, Sept. 14. A rotatable perforated steam pipe is placed in the juice trough of a sugar mill.

Evaporator plant for concentrating sugar juices or similar purposes. J. MUGLER. U. S. 1,598,301, Aug. 31.

Cane treatment. R. A. Marr. Can. 260,725, May 11, 1926. Cane material is digested in a soln. contg. an alkali metal sulfate and $ZnSO_4$.

Starch. A. R. Ling and D. R Nanji Can. 261,214, June 1, 1926. Starch paste is liquefied with malt diastase, the mash is boiled, cooled and treated at a temp. of approx. 50° with a diastase of ungerminated grain until the greater part of the starch content has been saccharified.

29—LEATHER AND GLUE

ALLEN ROGERS

Organization and control in the leather industry. Marcel Gillet. *Cuir tech* **15,** 330-5(1926). H. B. Merrill

Swedish legislation against weighting leather. Methods for testing the leather. Evert Norlin *Cuir tech* **15,** 267-71, *et seq* (1926).—The manuf. or importation of leather contg. "any material not required for the tanning or proper prepn. of leather" has been forbidden in Sweden since 1919. The original decree, besides specifically forbidding the use of the usual loading materials, fixed the max. limits for ash and water-sol. matter at 3 and 20%, resp ; the regulations were later modified to permit the manuf of Cr leather, the limits for ash and H_2O-sol. matter of vegetable leather being fixed at 2 5 and 22%, resp A tolerance of 0.5% in ash and 2.5% in H_2O-sol. matter is admitted. Methods of analysis employed in the official Swedish labs. are described. H. B. M.

The determination of fat in leather. D. Woodroffe. *J. Intern. Soc. Leather Trades Chem.* **10,** 219-21(1926).—With petroleum spirit (b. p. 40-60°) as solvent in the detn. of fat in chrome- and vegetable-tanned leathers fat-liquored with degras or cod oil, a lower fat content is obtained, if the leather is dried out thoroughly before the extn. It is suggested that water is removed with the fat in ordinary samples and is difficult to remove from the extd. fat by drying, giving high values for fat. J. A. Wilson

South Indian tanning materials. A comparative study. K. S Choudary and E. Yoganandam *J Intern. Soc. Leather Trades Chem.* **10,** 222-8(1926)—Data are given for tannin, nontannin, insol matter, optimum temp. of leaching, loss in tannin by fermentation, p_H value of solns., rate of diffusion into gelatin jelly, and color values of wattle, konnan, gothar, mangrove, avaram, babool, myrobalans, sumac and divi-divi. J. A. Wilson

Action of sodium sulfate in synthetic tanning materials. Edward Wolesensky. *Bur. Standards, Tech Papers* **20,** 529-44(1926).—Hide substance will remove H_2SO_4 from a soln. of Na sulfate and AcOH and will retain about 1.4% of its weight of the acid even after 72 hrs.' washing with water. The acid thus combined with hide substance cannot be completely displaced by syntans. Neutralizing the free H_2SO_4 in a syntan is not a safeguard against the introduction of H_2SO_4 into the leather. The presence of Na sulfate in a syntan will lead to errors in the detn. of tanning material by methods involving the use of hide powder. J. A. Wilson

Sole leather tanning. J. E. Weissberg. *Gerber* **52,** 143-5(1926)—A discussion of the application of modern protein chemistry to sole leather tanning. H. B M.

Two bath tannage. E. Stiasny. *Gerber* **52,** 151-3, *et seq.*(1926).—An adddress. H. B. Merrill

Official method (French) for the analysis of vegetable-tanned leather. P. Chambard *Cuir tech.* **15,** 375-8(1926). H. B. Merrill

Fermentation of divi-divi liquor. II. Acidity of divi-divi liquor. K. S. Choudary and E. Yoganandam *J. Intern. Soc. Leather Trades Chem.* **10,** 237-9(1926).—Measurements are given of acidity (lime water figure) and p_H value at intervals for 74 days, for hot and cold extn. and for solns. of 15° and 30° barkometer reading. J. A. Wilson

The utility of by-products from saccharin manufacture in the chemistry of synthetic tans and in the tannery. Walter Herzog. *Collegium* **1926,** 203-8; cf. *C. A.* **20,** 2910.—The use of p-$MeC_6H_4SO_2Cl$ (**I**), 1,2,4-$MeC_6H_3(SO_2Cl)_2$ (**II**) and p-$MeC_6H_4SO_3H$ (**III**) as raw materials for synthetic tans is dealt with. The starting point was the observation that *arylsulfaminoarylsulfonic acids* (**IV**) and *arylsulfonyloxyarylsulfonic acids,* obtained on coupling sulfanilic acid (**V**) and p-phenolsulfonic acid (**VI**) resp. with **I,** lack the character of tans, though they ppt. satd. glue and gelatin solns., but that compds. (without free OH or NH_2 groups) contg. two or more sulfamino groups beside a sulfonic group, have this character. One sulfamino group may be substituted with a sulfonyloxy group A compd. of this character is obtained on coupling nitro-**I** with **V,** following reduction with Fe and AcOH and conversion with **I** in alk. soln. After acidifying, the filtered soln, contg. the compd. $HO_3SC_6H_4NHSO_2C_6H_3MeNHSO_2C_6H_4Me$,

can be used immediately for tanning. A compd. with one sulfamino group substituted with a sulfonyloxy group is obtained analogously with **VI** instead of **V**. *Arylsulfaminobenzylsulfonic acids*, obtained from $O_2NC_6H_4CH_2Cl$ and Na_2SO_3, reduction and coupling with **I**, can be used at once in a concn. of 2–5%. **IV** is converted into genuine tans on treatment with CH_2O at 140–50°. *1-Naphthylamino-6-sulfonic acid*, coupled with **I**, is obtained analogously. A water-sol. tan is obtained from salicylic acid and **II** at 210–20° on absence of alkali. A potent tan is obtained from **III**, with addn. of basic catalysts (alumina), on heating to 170° and passage of air. This product is easily sol. in water and is a solvent for many difficultly sol. substances, as the phlobaphenes in the quebracho and dyes as alizarin, alizarin blue and Martius yellow. D. THUESEN

Preparation of isoelectric collagen. Applications. LOUIS MEUNIER AND PAUL CHAMBARD. *Rev. gén. colloides* **4**, 161–5(1926).—Isoelec collagen is prepd. by liming and unhairing calf skin, washing thoroughly, treating with successive changes of satd CO_2 soln. until no more lime is extd., washing with acetone and drying. The wet skin may be preserved indefinitely under satd. CO_2 soln. without danger of putrefaction The point of min. swelling of isoelec. collagen was found to be at p_H = 5.4. When it was put into solns. of different p_H values ranging from 4 5 to 5.9, it always tended to shift the p_H value in the direction of 5 4. It is, therefore, concluded that the isoelec point of purified collagen is 5.4. J. A WILSON

The insoluble matter of myrobalan extract. P. CHAMBARD. *Cuir tech.* **15**, 372–3 (1926); cf. *C. A.* **18**, 480, 1063.—The optically active particles of the insol. matter of myrobalan ext. are sol. in hot EtOH; on cooling, the material crystallizes in needles. The crystals are sol. in dil. NaOH. On neutralization of the NaOH soln., it is possible to obtain either crystals, an amorphous ppt., or an opalescent soln., depending on conditions. The soln. gives the reactions of a tannin with Fe^{++} and with gelatin. It is believed that the optically active particles are crystals of a tannin. H B. MERRILL

Sumach: its cultivation, analytical content and utilization. M. C. LAMB. *Shoe & Leather Rep.* **163**, No. 8, 18–20; No 11, 17–8(1926); *Leather Trades Year Book* **1926**, 80–90. J. A WILSON

A new kino from Tanganyika (ANON) **17**.

Coating leather with rubber. R MEYER. U. S 1,598,246, Aug. 31. Leather is dried for about 24 hrs. at a temp. of about 50° with exclusion of air and is then treated with a soln. of rubber.

Thiophenolsulfonic acid tanning and mordanting agents. A. THAUSS. U. S. 1,600,525, Sept 21. The reaction product of S and NaOPh or other highly sulfurized phenol is treated with an alkali metal sulfite, *e. g.*, Na_2SO_3, and with an oxidizing agent such as air at 70–80° to produce a sol material.

Treating hides and skins with auto-digested yeast preparatory to tanning. D. MCCANDLISH and W. R. ATKIN. Brit 235,678, Apr. 10, 1924. See U. S. pat. 1,570,383 (*C. A.* **20**, 838).

Depilating hides. H. C. ROSS, H. C. MARRIS and WALKER & SONS, LTD. Brit. 241,666, Sept. 1, 1924. Hides or skins are unhaired by a liquor comprising H_2O, S lime and NH_3 at a temp. of 10–45°.

Removing hair from green hides. M. BERGMANN, E. IMMENDÖRFER and A. IMMENDÖRFER. U. S. 1,599,358, Sept. 7. An alkali sulfide such as Na sulfide is converted with at least an equimol. proportion of NH_4Cl or other NH_4 salt into NH_4 sulfide, a sol. silicate is added, and hides are treated with the soln. thus formed. Cf. *C. A.* **19**, 1064.

30—RUBBER AND ALLIED SUBSTANCES

C. C. DAVIS

Isoprene and rubber. IX. The formation of cyclo-rubber from rubber hydrohalides. H. STAUDINGER AND W. WIDMER. *Helvetica chim. acta* **9**, 529–49(1926).—Expts. were carried out with the object of reducing rubber hydrohalides more completely than was accomplished by Harries and Evers (*C. A.* **16**, 3232) and thus obtaining a completely reduced hydro-rubber. Even on prolonged treatment, however, of rubber-HCl, rubber-HBr or rubber-HI with Zn, reduction did not occur and on subsequent pptn. with alc. an isomer with 0.5 the double bonds, designated *monocyclo-rubber*, was obtained, white powder, sol. in C_6H_6 and petr.-ether, insol. in EtOH and Et_2O, sinters

about 120°, m. about 130°. In alk. soln. rubber-HCl, rubber-HBr and rubber-HI liberated HCl, HBr and HI, resp. and formed iso-rubber. In solvents such as PhMe, xylene, PhCl and tetralin, and in the presence of HCl to prevent decompn., rubber and rubber-HCl gave with Zn dust and HOAc a more highly reduced product, *polycyclo-rubber*, $(C_{20}H_{32})_x$, in which only 1 double bond for 4 isoprene nuclei remained. The higher the b. p. of the org. solvent and the longer the treatment the greater the proportion of the polycyclic rubber sol. in Et_2O, the more sol. components having lower mol. wts. With Fe instead of Zn, a powder contg. Cl was obtained, with Al-bronze a tacky product contg. Cl, with Sn a powder almost free of Cl, whereas with Mg there was no action. That the formation of polycyclo-rubber did not involve regeneration of rubber from rubber-HCl and cyclization by $ZnCl_2$ was indicated by the failure to obtain similar products from rubber in C_6H_6 and dry $ZnCl_2$. However, on prolonged treatment of this character, a tacky product contg. about 0.5 the original no. of double bonds was obtained. Polycyclo-rubber was a white, hard mass, readily sol. in C_6H_6, PhMe, tetralin, $CHCl_3$, CCl_4 and CS_2, partially sol. in Et_2O and insol. in EtOH and Me_2CO. Depending on the mode of prepn. (*loc. cit.*) a gradual transition from Et_2O-sol. to Et_2O-insol products was found. After purification it gave an asbestos-like flocculent mass lacking all elastic properties, resembling purified gutta-percha, and when obtained by evapn. of its soln. gave a clear film similar to cellulose acetate. Polycyclo-rubber, had d_4^{17} 0.992, n_D^{17} 1.5387 and heat of combustion 10,500 cal. The m. p. and other phys. properties varied with the mode of prepn. Thus prepd. in tetralin, PhMe, or xylene, it was sol. in Et_2O, Et_2O and C_6H_6, resp., sintered at approx. 100°. 125° and 135°, resp., m. at approx. 135°, 145° and 160° resp., and had a mol. wt. corresponding to about $(C_5H_8)_{80}$, $(C_5H_8)_{100}$ and $(C_5H_8)_{150}$, resp. Titration with Br showed that the compds. of lower mol. wt. have a higher degree of cyclization than those of higher mol. wt. The product obtained by any mode of prepn. was a mixt. from which individual compds. could not be isolated. For such mixts. of compds. of high mol. wt. which are not true colloids the term *hemicolloids* is proposed. On hydrogenation of Et_2O-sol. polycyclo-rubber with Pt and H under high pressure at 270°, *i. e.*, under conditions where rubber forms hydrorubber, a *hydro-polycyclo-rubber*, $(C_{20}H_{34})_x$, was formed, white powder, m. 125–30°, the phys. properties of which were similar to those of polycyclo-rubber, but it was satd. to Br. Hydrogenation of monocyclo-rubber with Ni and H under pressure at 280° gave the same product and not the expected hydro-monocyclo-rubber, indicating that cyclization took place at a faster rate than reduction. Both monocyclo-rubber and polycyclo-rubber can be oxidized. O_3 or $KMnO_4$ gave an amorphous, insol. compd., C_5H_8O, identical with the product obtained by oxidizing rubber with benzoyl peroxide (cf. Pummerer and Burkhard, *C. A.* **17**, 898). Concd. HNO_3 did not attack the cyclorubbers so readily as it does rubber, but similar products were formed. S_2Cl_2 also attacked them less readily than it attacks rubber. Thermal decompn. of the cyclorubbers began about 350° and gave products which differed from those from the distn. of rubber (*e. g.*, by the absence of isoprene and dipentene), but which were not identified. Distd. *in vacuo* (0.1 mm.) similar products were obtained, with, however, a greater proportion of products with high b. ps. In the attempt to explain the formation of cyclorubbers from rubber-hydrohalides, simple aliphatic derivs. of similar character were treated in the same way. in the presence of the corresponding hydrohalide acid. With 3-ethyl-3-chlorononane and with 1-ethyl-1-bromo-4-methylcyclohexane, reduction and ring formation did not occur and only an *ethylene deriv.* was formed, the compn. of which was either $C_5H_{11}CH:CEt_2$ or $C_6H_{13}CEt:CHMe$. 2,6-Dimethyl-2,6-dichloroheptane and 2,6-dimethyl-2,6-dibromoheptane were not reduced, but gave identical mixts. of hydrocarbons, among which α-cyclogeraniol was identified. Dipentene dihydrochloride and dipentene dihydrobromide gave a mixt. of a terpene, a diterpene and high-boiling condensation products. The terpene was in turn a mixt. of $C_{10}H_{16}$ and $C_{10}H_{18}$, indicating partial reduction. The diterpene, which predominated, consisted of a mixt. of bicyclic and tricyclic terpenes which were not identified. For cyclization there must be present 2 double bonds and a halogen atom in the 4-position to the 1st double bond. Bornyl chloride gave a mixt. of mono- and diterpenes which were not investigated further. The expts. indicate that monocyclo-rubber has 1 of the following formulas:

$$.....CH_2CMeCH_2CH_2CH_2C(:CH)CH_2CH_2CH_2CMeCH_2CH_2CH_2C(:CH)CH_2CH_2......$$

or $$....CH_2CMeCH_2CH_2CH:C(CH_2)CH_2CH_2CH_2CMeCH_2CH_2CH:C(CH_2)CH_2CH_2....$$

X. The behavior of rubber on being heated. H. Staudinger and E. Geiger. *Ibid* 549–57.—The m. p. or rather the *softening point* where rubber forms a sticky ag-

glomerated mass varies with the impurities, with the previous treatment (mastication), with the time of heating and with the presence or absence of O. Thus Para rubber before and after mastication softened in air at 130–40° and 100–10°, resp., and *in vacuo* at 210–20° and 120–30°, resp., while plantation sheets before and after mastication softened in air at 130–40° and 100–10°, resp., and *in vacuo* at 170–80° and 120–30°, resp. O causes *autoxidation* and lowering of the softening point. The fusion involves almost no change in the no. of double bonds, but the viscosity changes greatly. *In vacuo* rubber begins to decomp. at about 250° with disappearance of the double bonds and formation of cyclo-rubber (cf. above). Polycyclo-rubber can readily be formed (50% yield) by long heating of rubber *in vacuo* at 300–20°. Simultaneously compds. of low mol. wt. distil. An almost quant. yield of polycyclo-rubber was obtained by heating rubber in Et_2O under pressure at 250° and pptg. with EtOH. Its phys. properties were nearly the same as those of the product prepd. otherwise (cf. above), but it was more nearly satd., 5 isoprene nuclei per double bond being present. It sintered at 90°, m. 125°, with d_4^{16} 0.992. Heated with Ni and H under pressure (85 atm.) at 290–5° it gave *hydropolycyclo-rubber*, $(C_{25}H_{42})_x$ (cf. above) d_4^{16} 0.986, n_D^{16} 1.5263, mol. wt. 2050, does not absorb Br nor react with hot HNO_3 or $KMnO_4$ and has the properties of a satd. cyclic paraffin hydrocarbon. Disagreement of previous data led to expts. on the dry distn. of purified rubber. Distd. rapidly in a CO_2 current at atm. pressure, 92.8% of distillate was obtained when cooled to —80° and 4% as residue. The distillate represented products of the direct decompn. of rubber and of the polycyclo-rubber first formed. On fractionation of the distillate, dipentene, isoprene, a cyclohexadiene and a tetrahydrotoluene were identified. Fractionally distd. in CO_2 at 300–20° dipentene was again the chief product. Distd. *in vacuo* at 300° and the residual polycyclo-rubber in turn distd. at 350–400°, the chief product (24%) of the 1st distn. was dipentene, whereas distn. of the polycyclo-rubber gave neither dipentene nor isoprene but higher boiling hydrocarbons. The expts. show that when rubber is heated, the extremely large mols. (macro-mols.) decomp. (1) to residues of 20–50 isoprene mols. which in turn form polycyclo-rubber, and (2) to smaller residues which form isoprene, dipentene and sesquiterpenes. C. C. DAVIS

Collodion solution for painting vulcanizing molds for glossy [and non-blooming] rubber products. WERNER ESCH. *Gummi-Ztg.* **40**, 2649–50(1926).—Painting or spraying the surface of molds is an effective way of rendering the vulcanizates glossy and preventing subsequent S bloom. The action is explained on the assumption that blooming is caused by gases escaping from the interior of the rubber after vulcanization and depositing mol. S on contact with the air and that the collodion film left on the rubber prevents this escape of gases contg. S. A suitable soln. contains by wt. celluloid scrap 6, castor oil 1, aldehyde-ammonia (or hexamethylenetetramine or furfuramide) 1, 90% denatured alc 46, AmOAc 23, Et_2O 23. C. C. DAVIS

The rubber industry in Mindanao. F. G. GALANG. *Philippine Agr. Rev.* **19**, 3–47(1926).—Chem. and mechanical analyses of 4 rubber soils are given. M. S. A.

Coating leather with rubber (U. S. pat. 1,598,246) **29**. Paving and surfacing material containing rubber (U. S. pat. 1,598,505) **20**. Compositions of rubber and cellulose derivatives (Brit. pat. 241,858) **23**.

SCHOTZ, S. P.: **Synthetic Rubber.** London: Ernest Benn, Ltd. 141 pp. 21s.

Rubber composition. S. A. OGDEN. Can. 260,626, May 11, 1926. A rubber compn. that can be dissolved and pptd. is made by mixing hydrocellulose with a rubber compd. and a catalyst and drying.

Rubber composition. S. MCMURRAY. Can. 261,268, June 1, 1926. Aluminous cement is intimately mixed with latex.

Rubberized fibrous compositions. W. G. O'BRIEN and P. BEEBE. U. S. 1,599,383, Sept. 7. Rubber is pptd. upon fibrous material from a toluene-alc. mixt. and superheated alc. vapor is utilized for drying and removal of toluene. U. S. 1,599,384 (W. G. O'BRIEN) specifies an app. for prepg. similar materials.

Molded articles from rubber and fibrous materials, etc. F. KAYE. U. S. 1,600,-047. Sept. 14. Paper-making materials are mixed, while in the beating engine, with a latex such as rubber, balata or gutta-percha, together with a coagulant, excess moisture is afterward removed on a paper-making machine, the soft sheets formed are disintegrated, and the resulting material is used for making molded or pressed articles.

Rubber compositions for lining tubes. J. SCHWAB, JR. Can. 258,340, Feb. 23, 1926. A mixt. of melted rubber, vulcanizing cement and S is heated for a period of time above the b. p., and allowed to cool below the b. p.; a quantity of vulcanizing cement is then added and thoroughly mixed.

Waterproof sheet. L. KIRSCHBRAUM. Can 260,604, May 11, 1926. A fibrous sheet is made by making an emulsion of water, rubber and a colloidal emulsifying agent, mixing this with fibrous pulp, forming into sheets, removing the water and permitting the rubber to coalesce.

Rubber from latex. C. C. LOOMIS and H. E. STUMP. U. S. 1,599,282, Sept. 7. A natural latex is partially coagulated to produce a plastic paste, formed into the shape desired in a finished article, and then converted into rubber. Cf. *C. A.* **19**, 2759.

Using rubber latex. J. A. DECEW. Can. 258,281, Feb. 23, 1926. Rubber emulsions are coagulated by bringing them into contact with colloidal Al hydrate.

India rubber substitute. C. BURKILL. Can. 262,517, July 13, 1926 A plastic substance is produced by mixing starch with an approx. 38° Bé. soln. of $MgCl_2$.

Rubberizing process. M. C. TEAGUE. Can. 262,973, July 27, 1926. A water repellant fibrous material is impregnated by treating the material with an agent which is miscible with water, oils, greases, or waxes, and an aq suspension of rubber.

Vulcanizing rubber articles. H. R. MINOR. U. S. 1,600,693, Sept. 21. In vulcanizing automobile tires or similar articles, CO_2 is introduced into an expansible bag in contact with the article within a mold, from a source of supply of considerably greater vol. than the vol. of the bag, the walls of which permit penetration of the CO_2 to form a protecting envelope when vulcanizing heat is applied

Vulcanization of rubber. L. B. SEBRELL. Can 263,012, July 27, 1926. A method of vulcanizing rubber comprises admixing it with a vulcanizing agent and an activator and incorporating diethylenediimine in this mixt. and heating. Cf. *C. A.* **20**, 2096

Vulcanizing rubber. C E BOORD and E. N. COLE. Can. 260,248, Apr. 27, 1926. The vulcanization of rubber is accelerated by vulcanizing the rubber in the presence of the reaction product of an aromatic disubstituted guanidine and 2-mercaptobenzothiazole

Vulcanizing rubber. C O NORTH and C. W CHRISTENSEN. Can. 258,626, Mar. 2, 1926. There is incorporated into the rubber the reaction product of an aromatic primary amine and an unsatd. aliphatic aldehyde contg. more than 2 C atoms, and heating the mixt with a vulcanizing agent.

Vulcanized products from rubber-bearing plants. F. T. LAHEY. U. S. 1,597,807, Aug 31. Plant material such as *Parthenium argentatum* or guayule is reduced to a plastic mass by grinding and is dried and vulcanized to form buttons, gears or other articles. U. S. 1,597,808 specifies grinding, milling and refining vulcanized rubber and adding liquid rubber latex and emulsified oils during the milling operation.

Etching rubber. SOC. D'EXPLOITATION DES PROCÉDÉS D'IMPRESSION SARDOU Brit. 241,542, Oct 15, 1924. A surface of a rubber sheet to be etched is vulcanized by the action of ultra-violet rays or S chloride, a design is formed on the surface and an etch-resist may be incorporated with the inked parts. A mixt. of HNO_3 and $K_2Cr_2O_7$ is then used for etching and the etched sheet is washed with acetone or alc. soda soln. Silex and fat-contg. fillings should not be present in the rubber.

Rubber vulcanization accelerators. M. L. WEISS. Brit. 241,838, Feb. 7, 1925. The reaction product of diphenylguanidine with 1-mercaptobenzothiazole or other similar reaction product of a guanidine and 1-mercaptobenzothiazole is used in vulcanizing rubber with ZnO and S.

Devulcanizing rubber. C. F. WILLARD. U. S. 1,598,470, Aug. 31. Vulcanized rubber assocd. with fiber is boiled with tar and H_2O or other emulsoid colloid soln. to devulcanize the rubber and the fiber is treated with NaOH and CS_2 to make it combine in the form of a colloidal cellulose with the rubber and obtain a product which may be revulcanized to form a light colored hard rubber.

Jacketed kettle with agitating apparatus for devulcanizing rubber. C. F. WILLARD. U. S. 1,598,185, Aug. 31.

Method of producing accelerator. L. B. SEBRELL. Can. 260,246, Apr. 27, 1926. Tri-substituted guanidine is made by admixing basic Pb carbonate with a thiourea, adding aniline and heating.

Golf balls. O. J. KUHLKE. U. S. 1,597,904, Aug. 31. A resilient metal sphere which may be formed of convolutions of wire has within it a mass of uncured rubber and a volatilizing agent and the rubber is vulcanized to convert it into a spongy mass.

CHEMICAL ABSTRACTS

Vol. 20. NOVEMBER 20, 1926 No. 22

1—APPARATUS AND PLANT EQUIPMENT

W. L. BADGER

A practical apparatus for determining bromine. ANON. *Chem.-Ztg.* **50**, 653–4 (1926).—A modified Lunge app. is depicted with a round-bottomed distn. flask connected by a tall U-tube to an absorbing tube with 10 bulbs in series; all joints ground glass. Most of the absorption tube lies horizontally, to give a better effect with solid reagents suspended in it. As absorbent 12 g. of Zn dust and 3.5 g. SrS, mixed with 40-cc. H_2O, are used. When a sample is distd. with $KMnO_4$ and dil. H_2SO_4 the absorbent is converted into $SrSO_4$, $ZnBr_2$ and H_2. After distg., the contents of absorption tube are washed into a 500-cc. graduated flask, concd $CdSO_4$ soln. is added in excess, the mixt. dild to the mark, and 100-cc. portion of the filtered liquid titrated with 0.1 *N* $AgNO_3$, with K_2CrO_4 as indicator. One to two drops HNO_3 and 3–4 drops $AgNO_3$ soln. are added, the mixt. is warmed gently, and the mixed AgBr and AgCl are treated as usual in the gravimetric analysis. If the $AgNO_3$ soln (0.1 *N*) $\times$ 0.01435 = n, and the wt. of mixed Ag halides = m, then $(m - n) \times 2 \times 1.8$ = % Br; 2 is the diln. factor and 1.8 = AgBr/(AgBr − AgCl) $\times$ 0.445. The method is recommended for the Br-extracted liquors of salt works. W. C. EBAUGH

Apparatus for the direct determination of carbon dioxide. J. E. UNDERWOOD. *Ind. Eng. Chem.* **18**, 1069–70(1926).—An app. for the rapid and accurate detn. of CO_2 by absorption is described. A novel feature is the design of the washing train which makes possible an easy replacement of the absorbents. Diagram, suggested procedure and tables of comparative results accompany the article. RUBY K. WORNER

Stream-line filter. J. W. HINCHLEY. *Chemistry & Industry* **45**, 660–4(1926).—A description is given of some developments in stream-line filters for lab. and commercial uses. By use of treated paper, the filtering rate was increased 500%. L. A. PRIDGEON

Filtering devices. H. B. GORDON. *Ind. Eng. Chem.* **18**, 1075–6(1926).—Description and sketches of two simple self-regulating devices for filtering large quantities of solution. RUBY K. WORNER

A trichromatic colorimeter suitable for standardization work. J. GUILD. *Trans. Opt. Soc.* (London) **27**, 106–29(1925–6); *Brit. Chem. Abstracts* **1926**, 303B.—A description of a trichromatic colorimeter which may be used to obtain the specification of any color whatever in a form which may be converted if desired to any fundamental basis of specification. D. E. SHARP

An all-glass circulating pump for gases. FRANK PORTER, D. C. BARDWELL AND S. C. LIND. *Ind. Eng. Chem.* **18**, 1086–7(1926). E. J. C.

Industrial electric heating. J. H. CROSSLEY. *Electrician* **97**, 386(1926).—Electric drying and baking ovens are shown and described. Other applications discussed are: curing rubber, boiling linseed oil, stoving enamel, etc. C. G. F.

Fractional vacuum distillation. S. A. BUSSE. *Troud. Naoutch. Chim.-Farm. Inst.* No. **10**, 84–7(1924); *Chimie et industrie* **16**, 95(1926).—Comparative tests carried out with a Vigreux flask and a Classen flask on spirits of turpentine and on oil of *Thuja gigantea* showed that the Vigreux flask is preferable. A. PAPINEAU-COUTURE

A method for cathodic coating of quartz strings. J. H. CH. QUELLE. *Physica* **6**, 249–57(1926).—A detailed description of the prepn. of metal-coated thin quartz wires including the "shooting" of the wires to a thickness of some μ's, the spraying in vacuum of the string and the soldering of the ends. The spraying took place intermittently for one min. with ten min. rest, the string was stretched out parallel to a silver (or gold) plate as cathode (14 $\times$ 7 cm.) and an Al loop as anode, both covered with mica. The potential was such as to give a 10-cm. spark length, c. d. was 10 to 15 milliamp. After about 30 periods the required coating was obtained. Gold has several advantages over silver. B. J. C. VAN DER HOEVEN

Thomas gas calorimeter—factors affecting its precision, flexibility and reliability.

R. A. RAGATZ AND O. L. KOWALKE. *Ind. Eng. Chem.* **18,** 1087–90(1926).—The instrument and its operation are described. In 40 calibration tests against a Junkers app. the difference was over 1% in only 4 tests, in most cases about 0.5%. Changes in line gas pressure of 2–8 in. H_2O, or changes in atm. humidity of room of 29–88% satd. did not affect the instrument. Sudden changes in room temp. caused a change in reading of approx. 0.1 B. t. u./°F. change. When the supply gas was changed (increase of 87 B. t. u.) 4.1 min. was required for the first response, 12.2 min. to register 90%, 19.3 to register 95% and 60 min. to register 100% of the total change. W. B. P.

Efficiency in use of heat exchangers. S. C. ROSS. *Oil & Gas J.* **25,** No. 13, 161–2 (1926) —The advantages of the shell and tube type of heat exchanger are given. M. B. HART

A new pressure regulator. ANON. *Gas u. Wasserfach* **69,** 811–2(1926).—A device for regulating gas pressure in a conduit, pressure drop across an orifice, etc., operates entirely on hydraulic principles, the power member being actuated by the overflow from one side or the other of a (divided) differential chamber. W. B. PLUMMER

The aspiration psychrometer. H. EBERT. *Z. Physik* **35,** 689–97(1926).—Theory and tables for the aspiration psychrometer are given. F. R. BICHOWSKY

A simple spinthariscope. L. C. CARTWRIGHT. *J. Chem. Education* **3,** 942–3 (1926). E. J. C.

Sectioning and grinding machines for the preparation of microscopical specimens of teeth, fossils and minerals. C. F. BÖDECKER. *Dental Cosmos* **68,** 860–7(1926).—A description of new machines for cutting and polishing sections for microscopical examn. JOSEPH S. HEPBURN

"Métalix" x-ray tubes. E. W. WEISS. *La nature* **54,** ii, 99–102(1926).—An illustrated description. C. C. DAVIS

Anastigmatic mirror condensor for dark-field illumination and ultramicroscopy. H. SIEDENTOPF. *Kolloidchem. Beihefte* **23,** 218–42(1926).—A mathematical and geometrical treatment discussing astigmatism and aberration. R. C. NEWTON

Wood pipe. M BERGER. *Chem.-Ztg.* **50,** 652–3(1926).—The use of wood pipe, both that made in sections of definite length and that built up in "continuous" fashion, is now finding wide acceptance in Germany, for power-plant purposes in particular. The practice developed in America and Northern Europe has been followed closely. As such pipe is attacked by many chemicals less than are metals, its use in paper, cellulose and chemical factories is recommended. W. C. EBAUGH

The steam accumulator in textile mills (HUBBARD) **25.** An apparatus for the separation of grit and coarse particles from fine powders (GALLIE, PORRITT) **30.** Apparatus for quenching, pickling and washing metal articles or other materials (U. S. pat. 1,601,-497) **9.**

Generator for acetylene, oxygen or other gases. CHOFFEL ET JACQUELIN. Brit. 243,369, Nov. 20, 1924.

Continuous-absorption apparatus adapted for treating gases and vapors. M. NUSS. U. S. 1,602,500, Oct. 12 A chamber for charcoal or other absorptive material is provided with connections for supply of charging, discharging and regenerating fluids, and has baffles extending longitudinally of the path of these fluids.

Multiple-chamber reaction apparatus for various purposes. E. OPDERBECK. U. S. 1,601,879, Oct. 5

Receptacle (containing vertical baffle rods) for separating liquid particles from gases. H. S. HELE-SHAW and T. E. BEACHAM. Brit. 242,918, Dec. 29, 1924.

Film evaporator for treating liquids. NAAMLOOZE VENNOOTSCHAP NEDERLANDSCHE INSTALLATIE MAATSCHAPPIJ THERMA AND A. O. H. PETERSEN. Brit. 242,883, May 1, 1925.

Filter for separating dust, oil and water particles, etc. from compressed air or other gases. C. L. BURDICK. Brit. 242,388, Sept. 12, 1924.

Heat-exchange apparatus for oils, etc. K. MUHLEISEN. U. S. 1,601,874, Oct. 5.

Filter for oils or other liquids. D. E. ERICKSON. U. S. 1,603,004, Oct. 12.

Sedimentation apparatus for separating oil from heavier liquids. R. B. MORISON, R. E. TUCKER and H R. EVANS. Brit. 243,428, Aug. 25, 1924.

Apparatus for determining humidity of gases. J. C. IRWIN, JR. U. S. 1,601,243, Sept. 28.

Heat-exchange device for air and furnace gases or other fluids. M. E. ESBRAN.

U. S. 1,601,355, Sept. 28. Rotating disks are mounted in slits in a partition sepg. conduits between contents of which heat exchange is to be effected.

Oven for laboratory use. H. S. SHARMA and G. D. DESAI. Brit. 243,223, April 14, 1925.

Shaft furnace. E. CORNET. Brit. 243,050, Aug. 16, 1924.

Apparatus for melting and casting celluloid, casein and similar materials. PRÄCISIONSGUSSFABRIK GEB. ECKERT. Brit. 243,514, Nov. 17, 1924.

Kiers for circulating treating liquids in contact with material supported on a perforated false bottom. P. F. HADDOCK. Brit. 243,262, June 15, 1925.

Column still (with thermostatic control device) for rectifying alcohol or other liquids. W. A. PETERS, JR. U. S. 1,601,320, Sept. 28.

Apparatus for drying fruits, vegetables or other materials. G. R. ANDERSON. U. S. 1,603,103, Oct. 12.

Tunnel kiln for dehydrating fruits or other materials. L. N. MILLER. U. S. 1,602,988, Oct. 12.

Filters. GENERAL ELECTRIC CO., LTD. AND L. G. GOLDSMITH. Brit. 243,176, Dec. 6, 1924. Structural features of asbestos paper filters for removing suspended solids from hot gases and the like are described.

Filter for liquids. PIRBRIGHT CO., LTD. AND J. T. PEDDIE. Brit. 243,107, Sept 9, 1924. A filter adapted for filtering H_2O contg. small traces of oil is formed of cow hair felted with jute and bound with wire or caged with a perforated backing.

Filter for water or other liquids. T. LINKE. U. S. 1,603,126, Oct. 12.

Water still with thermostatic regulator. C. DAY. Brit. 242,328, March 25, 1925

Apparatus for filtering gases in stages. T. THOMSON and N. NISBET. Brit. 243,117, Sept. 18, 1924.

Filter for gasoline or other liquids. H. W. WEAVER and J. M. PHILLIPS. Brit 242,917, July 1, 1925.

Funnel filter for milk or other liquids. A. J. CLARE. Brit. 243,257, June 8, 1925

Thermostat. J. A. SPENCER. Brit. 243,511, Nov. 10, 1924.

Thermostat for heating apparatus, etc. C. P. WOLFE. U. S. 1,601,422, Sept. 28

Thermostatic valve control. H. T. THORP AND T. THORP & CO., LTD. Brit 242,774, Oct. 30, 1924.

Thermostat for controlling gas valves. T. J. FOLEY. U. S. 1,602,352, Oct. 5.

Thermostatic control device for vulcanizing or other apparatus. A. J. NELSON U. S. 1,601,408, Sept. 28.

Thermostat for control of electric circuits, etc. J. A. SPENCER. U. S. 1,602,510 Oct. 12.

Thermionic valves. GENERAL ELECTRIC CO., LTD. AND C. J. SMITHELLS. Brit 242,438, Nov. 11, 1924. A filament coated with electron-emitting material has a core consisting of an alloy of Pt with Fe 3% or Cr 5% or a similar alloy. A coating of alk earth oxide is applied, preferably by the method described in Brit. 241,984 (*C. A.* **20** 1153).

Thermionic valves. C. SEYMOUR, G. SHEARING and H. G. HUGHES. Brit. 243,056 Aug. 19, 1924. Bulbs of SiO_2 or other material are provided with metal jackets through which H_2O for cooling may be circulated.

Thermionic valves. WESTERN ELECTRIC CO., LTD. Brit. 243,200, Jan. 31, 1925 A device for "cleaning up the vacuum" of a thermionic valve is formed of a wire or ribbon of Al or other metal of high vaporizing point, coiled on a ring of refractory metal such as Ni or Mo, and vaporized by high-frequency induction heating. Vaporized metal is deposited around the exhaust tubulure of the valve. Mg or Ca may be used as "getters" instead of Al with low-power valves.

Thermionic or vacuum-tube apparatus with beryllium filaments. A. NYMAN Brit. 242,661, Nov. 7, 1924.

X-ray apparatus. NAAMLOOZE VENNOOTSCHAP PHILIPS' GLOEILAMPEN-FABRIEKEN Brit. 242,946, Nov. 17, 1924.

X-ray apparatus. NAAMLOOZE VENNOOTSCHAP PHILIPS' GLOEILAMPEN-FABRIEKEN Brit. 242,915, March 21, 1925.

X-ray apparatus. SOC. ANON. ETABLISSEMENTS GAIFFEGALLOT ET PILON. Brit 243,320, Nov. 18, 1924.

X-ray apparatus. NAAMLOOZE VENNOOTSCHAP PHILIPS' GLOEILAMPEN-FABRIEKEN Brit. 243,310, Nov. 20, 1924. A modification of the app. of Brit. pat. No. 208,10 is specified.

Röntgen-ray apparatus. REINIGER, GEBBERT & SCHALL AKT.-GES. Brit. 243,680 Nov. 26, 1924.

Electron-discharge device. J. E. HARRIS. U. S. 1,601,066, Sept. 28. A cathode is employed composed of alk. earth oxides, and an oxidized metallic grid is used having as one of its constituents a material such as Cr oxide capable of forming thermionically inactive compds. with the alk. earth oxides. Cf. *C. A.* **20,** 2264.

2—GENERAL AND PHYSICAL CHEMISTRY

GEORGE L. CLARK AND BRIAN MEAD

Chemistry in 1876. HENRY LEFFMANN. *Catalyst* **11,** No. 6, 1–4(1926).—A concise statement of the status of chemistry in 1876, and of the advances since then. JOSEPH S. HEPBURN

The emerald table of Hermes Trismegistus. TENNEY L. DAVIS. *J. Chem. Education* **3,** 863–75(1926).—"Three Latin versions which were current among later alchemists." E. J. C.

Paracelsus library. ANON. *Hahnemann Medical College and Hospital of Philadelphia Souvenir of the Sesqui-Centennial* 7–17(1926).—A bibliographical list of the original texts, commentaries and translations of the works of Paracelsus in the Hering Collection now the property of the College. JOSEPH S. HEPBURN

Joseph Priestley. E. F. SMITH. *Science* **64,** 317–9(1926).—Priestley lecture. E. J. C.

James Alexander Lyman. EDW. P. BARTLETT. *Science* **64,** 319–20(1926).—An obituary. E. J. C.

Wilhelm Körner. RICHARD ANSCHÜTZ. *Ber.* **59A,** 75–111(1926).—An obituary, with portrait and bibliography. E. J. C.

Whitman Howard Jordan. R. W. THATCHER. *Ind. Eng. Chem.* **18,** 1093(1926).—A brief biography, with portrait. E. J. C.

Progress of a year. A chemical review. D. H. KILLEFFER. *Ind. Eng. Chem.* **18,** 1041–6(1926).—The outstanding chem. happenings and achievements during the past year are discussed. E. J. C.

A look ahead. JAMES F. NORRIS. *Ind. Eng. Chem.* **18,** 994–8; *Science* **64,** 311–7(1926).—Presidential address made at the time of the 50th anniversary meeting of the Am. Chem. Soc. E. J. C.

The problem of secondary metals in world affairs. F. W. WILLARD. *Ind. Eng. Chem.* **18,** 1178–82(1926). E. J. C.

Isolation or coöperation in research. VERNON KELLOGG. *Reprint & Circ. Series of Natl. Research Council* No. **67,** 7 pp.(1926).—An address. E. J. C.

Scientific and industrial research in Holland. W. ROSENHAIN. *Engineer* **142,** 324–5(1926).—An illustrated account of the phys. lab. of the State Univ. of Leyden and of the Philips Lamp Co. at Eindhoven. D. B. DILL

The physicochemical research laboratories of the Siemens & Halske and Siemens-Schuckert companies. H. GERDIEN. *Siemens-Z.* **6,** 413–9(1926).—Description of buildings, equipment, special app., etc. C. G. F.

The library chemist. A. W. KENNEY. *Catalyst* **11,** No. 6, 12–3(1926).—A discussion of the opportunities for chemists as technical librarians and chemical bibliographers. JOSEPH S. HEPBURN

A determination of the scientific attitude. F. D. CURTIS. *J. Chem. Education* **3,** 920–7(1926). E. J. C.

Honor students in chemistry. ARTHUR A. NOYES AND JAMES E. BELL. *J. Chem. Education* **3,** 888–92(1926). E. J. C.

Practical chemistry for beginners. H. A. J. PIETERS. *J. Chem. Education* **3,** 876–87(1926). E. J. C.

An advanced chemistry course in a high school. OSCAR R. FOSTER. *J. Chem. Education* **3,** 893–6(1926). E. J. C.

The value of tests in writing chemical equations. R. B. HUTCHINS. *J. Chem. Education* **3,** 915–9(1926). E. J. C.

Chemical forces in the light of recent research. H. ULICH. *Z. angew. Chem.* **39,** 633–7(1926).—A review of atomic structure and crystal structure evidence bearing on the nature of valence. G. L. WENDT

The periodic system, chemical bonds and crystal structure. A. SOMMERFELD. *Nature* **117,** 793–5(1926). The elements at which sub-groups are completed are shown by the periodic system. In addn. to the 8-electron shell (inert gases), binary compds. show stability when their elements have the 18-shell or, more so, the 2-shell. Tetra-

hedral symmetry occurs *only* in binary compds. having both components at most 3 places from a 4-shell, and both equally distant. Such compds. probably contain nonpolar bonds. J. E. SNYDER

Methods of preparation and determination of the weight of the normal liter of hydriodic acid gas. E. MOLES AND R. MIRAVALLES. *Anales soc. españ. fís. quím.* **24,** 356–94(1926).—HI gas is very sensitive to light, reacts easily with org. substances like stop-cock grease and is decompd. by large glass surfaces like glass wool, particularly in the presence of traces of H_2O. It also attacks Hg even when very dry. This makes it very difficult to work with. To use in measuring the d., pure HI gas was prepd. from different sources by (*a*) direct synthesis from the elements; pure H charged with the vapor of twice sublimed I was passed over platinized asbestos heated to 300° and the gas, accompanied by an excess of H, was dissolved in H_2O; (*b*) by hydrolysis of PI_5, or the action of I suspended in H_2O on moist P, the gas was washed by moist P and dissolved in H_2O; (*c*) by reduction of I by H_2S, which did not give a gas under convenient conditions and was abandoned; (*d*) by the reaction of HPO_3 and NaI or a mixt. of NaI + NH_4I. A dry mixt. of P_2O_5 and I was prepd., the necessary amt. of H_2O added *in vacuo*. Under the conditions described this was the best method, giving almost theoretical yields, and the HI gas was of excellent quality and could be condensed directly. The dissolved HI gas was evolved by dropping the liquid on an excess of P_2O_5, purified by washing with a small amt. of H_2O, dried, condensed and distd. Under these conditions the gas made by (*a*) and (*c*) gave very concordant d. figures, but when obtained as in (*b*) they were always 1.5 per 1000 higher, although agreeing well with one another. Here, as is always the case with a gas prepd. by P or its compds., the gas is accompanied by heavier components which cannot be eliminated by chem. purification or fractional distn. The mean of 20 detns. of the wt. of the normal liter with all corrections, is L_0 = 5.78882, while that obtained by the P method is always near 5.7976. A special technic is described for measuring the pressure without allowing the HI gas to attack the Hg by using a compensator of paraffin oil and bulbs in the lines filled with crushed potash to absorb any traces of HI which could diffuse through the oil. Detns. were made at pressures of $^2/_3$ and $^1/_3$ atm. In view of the small no. of detns. and their concordance they are given only as tentative. At $^2/_3$ atm. the wt. of the l. referred to 1 atm. was L = 5.768 and at $^1/_3$ atm. L = 5.731. The detns. allow calcn. of the deviation from the Avogadro law and the mol. wt. of HI. E. M. SYMMES

Internal pressure and free space. W. HERZ. *Z. Elektrochem.* **32,** 210–3(1926).—By free space is meant the difference between the actual vol. of a substance and the vol. actually occupied by the mols. at rest. Free space ought to be connected with internal pressure and in fact the product is roughly const. except near the crit. temp. F. R. B.

Expansion coefficient and free space. W. HERZ. *Z. Elektrochem.* **32,** 460–2 (1926).—H. shows in 4 tables for heptane, $SnCl_4$, AcOH and Cl that a parallelism exists between the coeff. of thermal expansion $\alpha = (D - D_1)/D_1(T_1 - T)$, where T and D are abs. temp. and density, resp., and the "free space" $V_f = (M/d) - (M/d_0)$, where d and d_0 are density at some temp. and at zero temp., the latter from the law of corresponding states. α and V_f both increase with increasing temp.; their quotient first rises slightly, then becomes const. and finally begins to fall at increasing rate when the crit. point is approached. This behavior was also found for pentane, hexane, octane, Me formate, Me acetate, Me propionate, Me butyrate, CCl_4, MeOH, EtOH, PrOH, C_6H_6, fluorobenzene and NH_3. Water shows large discrepancies; around 500° abs. an approx. const. quotient is found. B. J. C. VAN DER HOEVEN

The contraction in volume during the formation of aromatic compounds at the absolute zero. W. HERZ. *Z. anorg. allgem. Chem.* **153,** 339–40(1926); cf. *C. A.* **20,** 2266.—From the zero pt. d. of 14 aromatic compds. H. obtains the zero pt. mol. vol., MV_0, and from existing data the zero pt. at. vols., AV_0, of the constituent atoms is known. Hence $\Sigma AV_0 - MV_0$ is calcd. and the percentage contraction in vol. during the formation of the aromatic compds. at the abs. zero, $100(\Sigma AV_0 - MV_0)/MV_0$, is obtained. It is emphasized that for aromatic compds. the zero pt. at. vol. to be taken for C in the nucleus is 3.99 as against 5.30 in the side chain or in aliphatic compds. R. E. GIBSON

Experiments on the electrical symmetry of nickel molecules. ALBERT PERRIER AND CH. E. BOREL. *Arch. sci. phys. nat.* **7,** 375–88(1925); cf. *C. A.* **20,** 1171.—At 360°, under the conditions of these experiments, an elec. current did not produce in Ni any longitudinal magnetic polarization which would be caused by the presence of mol. elec. moments of the magnitude 10^{-19} e. s. c. g. s. Fe has a mol. elec. moment of 9.7×10^{-18}. This somewhat unexpected difference between Fe and Ni is discussed. R. H. LOMBARD

Gold in quicksilver. W. Venator. *Z. angew. Chem.* **39**, 229(1926).—A note referring to an alchemical book of 1590 where Au and Hg are considered to be 2 forms of the same substance. V. also mentions the widespread occurrence of traces of Au in Hg and the difficulty of removing them. M. A. Youtz

The crystalline structure of ruthenium and of osmium. G. R. Levi and R. Haardt. *Gazz. chim. ital.* **56**, 369–75(1926).—In continuation of previous work on finely divided metals, the cryst. structure of finely divided Ru and Os was studied, previous results (Hull, *C. A.* **16**, 1706, 3563) not including data on the metals in powder form. The metals, were heated *in vacuo*, both slowly and by instant chilling. The results were the same in each case. The reticular distances agreed well with the results of Hull and the conformity of the observed and calcd. intensities was better than found by Hull (cf. *C. A.* **20**, 2947). The following data are for Ru and for Os, resp.: *a* 2.680 2.714; *c* 4.261, 4.316; axial ratio 1.59, 1 59; calcd. d. 12.71, 22.98. The observed and calcd. results confirm the hexagonal structure of the compact metals. C. C. D.

The Lorentz factor and the intensity distribution in Debye-Scherrer rings. M. v. Laue. *Z. Krist.* **64**, 115–42(1926).—A mathematical discussion of the meaning of the Lorentz factor. L. considers the cases of single crystals and of very fine crystal particles; the effect of the aperture defining the incident beam; the dependence of the width of the lines on the form of the crystals; and the influence of the size of the particles. L. S. Ramsdell

Hexagonal space group criteria and the crystal structure of β-quartz. R. W. G. Wyckoff. *Z. Krist.* **63**, 507–37(1926).—A tabulation of the distinguishing criteria for all of the special cases of the hexagonal space groups. W. gives a more detailed statement of the data for high-temp. β-quartz than occurred in a previous report (*C. A.* **20**, 1154). L. S. Ramsdell

X-ray investigations on the platinum metals, silver and gold. Tom Barth and Gulbrand Lunde. *Norsk. Geol. Tids.* **8**, 258–69(1926).—Precision measurements gave the following lattice dimensions: Ag, a = 4 078 A. U.; Au, a = 4.070 A. U.; Pd, a = 3.873 A. U.; Pt, a = 3 903 A. U.; Rh, a = 3.794 A. U.; Ir, a = 3.823 A. U.; Ru, a = 2 695 A. U., c = 4 273 A. U., c/a = 1.586; Os, a = 2.724 A. U.; c = 4.314 A. U.; c/a = 1 584. The measurements of Bridgman on compressibilities are used to calc. the effect of temp. and pressure on lattice spacings. The % increase in the lattice const. when advancing from Ru, Rh, Pd, Ag to the higher homologs becomes greater at rising pressures and smaller at rising temps. Independent of the physical conditions the increase in lattice const. always becomes smaller with rising at. no. The at. vols. are calcd. from the data and plotted on the at. vol. curve. G. L. Clark

Röntgenographic examination of metallic hydrides. Adolfo Quilico. *Atti accad Lincei* [6] **4**, 57–62(1926).—Induced by the discordant results published by various experimentors on Cu hydrides, a röntgenographic examn. was made of each of the products to det their nature. The products described as Cu hydrides by Leduc (*Compt. rend* **113**, 71(1891)), by Schoor (*Arch. néerland.* **12**, 96; *J. B.* **1877**, 273) and by Bartlett and Merrie (*Am. Chem. J.* **1895**, 196) are composed of pure Cu, though they may occlude H in too small an amt. to modify appreciably the lattice structure of the Cu. The products obtained by Wurtz (*Compt. rend.* **18**, 102(1844)) by reducing $CuSO_4$ with H_3PO_2, the only method found to give a product contg. H in appreciable quantity (cf. Berthelot, *Compt. rend.* **89**, 1004(1874); van der Burg, *Maandbl. Nat.* **7**, 102(1877)), varied in compn. and properties with the conditions. At or below 40° and avoiding all evolution of H, the products were black and on heating or by percussion yielded only Cu and H. The variation of the H content and its behavior on x-ray examn. showed the products to be *amorphous Cu* in which H was occluded. Under the conditions specified by Wurtz (approx. 60°), the product was red-brown, contained a variable amt. of H, and on being heated yielded Cu_2O mixed in some cases with a little Cu. It was therefore assumed to be Cu_2O contg. occluded H in considerable amt. and mixed with a small amt. of the amorphous product described above. At the b. p. products were obtained, the compn. of which varied from pure Cu to mixts. of Cu_2O and Cu, according to the rapidity with which the reaction was carried out. The solid hydrides of As, Sb and Bi are being studied. C. C. Davis

The crystalline structure of some bivalent chlorides. G. Bruni and A. Ferrari. *Atti accad. Lincei* [6] **4**, 10–3(1926).—In continuation of previous work (*C. A.* **20**, 1344) the *cryst. structures of $MnCl_2$, $CdCl_2$ and $ZnCl_2$* were studied because of their close analogy with $MgCl_2$, because of the isomorphic relationships among compds. of these metals and because both $MnCl_2$ and $CdCl_2$ give mixed crystals in all proportions with $MgCl_2$, whereas $ZnCl_2$ does not. Anhydrous $MgCl_2$, $MnCl_2$ and $CdCl_2$ are rhombohedric with axial ratios of 2.45, 2.34 and 2.20, resp. The structure of $ZnCl_2$ was less clearly defined,

but appeared to be rhombohedric or hexagonal, with an axial ratio of 2.36. The calcd. d. of $ZnCl_2$ was 3.10 (cf. the exptl. values of 2.75–2.90). Because of the hygroscopic nature of the chlorides, a new *technic for obtaining photograms from the dry salts* was developed. This involved pulverizing the fused salt in a current of HCl under a dil. C_6H_6 soln. of paraffin. Individual crystals were thus obtained microscopically and dried *in vacuo*, which left a protective film of paraffin on each crystal. Supplementary tests indicated that $CaCl_2$, $NiCl_2$ and $CoCl_2$ have a cryst. structure analogous to that of $MgCl_2$, $MnCl_2$ and $CdCl_2$. Röntgen photograms of $MgCl_2$, $MnCl_2$ and $CdCl_2$ are shown. C. C DAVIS

Organic crystals. W. H. BRAGG. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926**, 21–7.—Brief outline of the value of x-ray investigations in studying the mol. structure of org. crystals and of the nature of the results obtainable so far. **Tables relating to long-carbon-chain derivatives.** A. MULLER. *Ibid* 27–9.—Values for the cleavage spacings of fatty acids with both odd and even numbers of C atoms, unsatd. fatty acids and normal hydrocarbons are tabulated and briefly commented upon. G. SHEARER. *Ibid* 29–38.—Values for the cleavage spacings of esters, ketones, α-acid-alcs., α-bromoacids, nitriles, amides, alcs., metallic salts, dibasic acids, amine hydrochlorides, phenones, *p*-phenols, and acids with multiple bonds, are tabulated and briefly commented upon. **Succinic acid, etc.** K. YARDLEY. *Ibid* 38–41.—See *C. A.* **18**, 1929; **19**, 2891; **20**, 49. **General list of organic crystals.** W. T. ASTBURY. *Ibid* 41–3. —Bibliography with very brief abstracts (including references to work as yet unpublished) on x-ray crystallographic investigations of org. compds. A. P.-C.

X-ray analysis of crystal structures and its relation with chemical constitution. W. L. BRAGG. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926**, 44–65.—A discussion of the interpretation and abs. value of the results of x-ray analysis of crystal structures, and of the means available for confirming or completing, if necessary, the information obtained from the x-ray examn. The article is followed by a 25-page discussion in which took part Sir W. Pope, H. E. Armstrong, W. Barlow, Lowry, Mauguin, Swarts, Job and Duclaux. A. PAPINEAU-COUTURE

Crystals of some organic compounds. H. BUTTGENBACH. *Mem. Soc. R. Sci. Liege* **12**, 25 pp.(1924); *Mineralog. Abstracts* **3**, 151.—Crystallographic constants are given for derivatives of *cotarnine* ($C_{12}H_{15}NO_4$) and for cyclic org. compounds of Sn. J. F. SCHAIRER

The crystallography of trimethylenetrinitroamine ($C_3H_6O_6N_6$). P. TERPSTRA. *Z. Krist.* **64**, 150–55(1926).—Crystallographic and x-ray data are given for this compd. Orthorhombic, space group V_h^1. There are 8 mols. in the unit cell, which has the dimensions a = 11.64, b = 13.25, and c = 10.80 A. U. L. S. RAMSDELL

The structure of compounds of the type MXO_4. W. BASCHE AND H. MARK. *Z. Krist.* **64**, 1–70(1926).—Barite ($BaSO_4$), celestite ($SrSO_4$), anhydrite ($CaSO_4$), anglesite ($PbSO_4$), $KMnO_4$, and $KClO_4$ all have the orthorhombic space group V_h^{16}, with the following dimensions for the unit cells: 8.85, 5.45, 7.14; 8.3, 5.3, 6.8; 6.20, 6.94, 6.97; 8.46, 5.38, 6.95; 9.10, 5.69, 7.40; and 8.84, 5.65, 7.23, resp. The process of calcg. the double refraction from the structure data is described and applied to the case of barite. L. S. RAMSDELL

The crystal structure of the A-modification of the sesquioxides of the rare earth metals (La_2O_3, Ce_2O_3, Pr_2O_3, Nd_2O_3). W. ZACHARIASEN. *Z. physik. Chem.* **23**, 134–50 (1926).—The A-modification is stable at the highest temp., the B-modification stable at medium temps. and the C-modification at lowest temp. These oxides crystallize in the triangular trapezoidal class. The dimensions for the hexagonal elementary cell contg. 1 mol. are for La_2O_3, a = 3.93 A. U., c = 6.12 A. U.; for Ce_2O_3, a = 3.88 A. U., c = 6.06 A. U.; Pr_2O_3, a = 3.85 A. U.; c = 6.00 A. U.; Nd_2O_3, a = 3.84 A. U.; c = 6.01 A. U. MERRILL FENSKE

The structure of crystalline sodium hydrofluoride and the form of the ion HF_2. C. C. ANDERSON AND O. HASSEL. *Z. physik. Chem.* **123**, 151–9(1926).—The length of the rhombohedral edge of $NaHF_2$ was computed to be 3.05 A. U. The exptl. value of 6.15 A. U. indicates that both face diagonals bisect, the rhombohedral itself being face-centered. The space diagonal was computed to be 13.98 A. U. and the exptl. value was 13.84 A. U. The distance between H and F in the ion HF_2 is given as 1.25 A. U. MERRILL FENSKE

Crystal structure and chemical constitution of basic beryllium acetate and its homologs. G. T. MORGAN AND W. T. ASTBURY. *Proc. Roy. Soc.* (London) **112A**, 441–8 (1926).—X-ray analyses of *basic Be acetate*, $OBe_4(AcO)_6$, (see *C. A.* **18**, 603) showed abnormal spacings which correspond to the cubic space-groups T_h^4 or O_h^7. Laue photo-

graphs show the space-group to be T_h^4 and thus the mol symmetry to be 12-fold. The O atm. lies at the center of a regular tetrahedron of Be atoms. The 6 (AcO) groups are associated with the 6 edges Each (AcO) group is sym about a *dyad* axis, and its plane must lie oblique to the resp. edge. *Basic Be pivalate*, $OBe(Me_3CCO_2)_6$, was prepd. from pivalic acid and $Be(OH)_2$ by refluxing in light petroleum Crystn. from petroleum yields colorless bi-pyramidal crystals, m 163°, sp. gr 1 05. Abnormal spacings correspond to 2 possible monoclinic space-groups, C_s^4 or C_{2h}^6. With a structure strikingly similar to the acetate, the crystals are concluded to be monoclinic dogmatic, space-group C_s^4, with 8 asymmetric mols in a face-centered cell. *Basic Be isobutyrate*, $OBe_4(Me_2CHCO_2)_6$, was prepd. from isobutyric acid and $Be(OH)_2$ Needles, m. 88–89°, sp. gr. 1 14, were crystd from petroleum Analyses indicate a triclinic pinacoidal unit. The crystal type differs decidedly from the 2 previous types. *Basic Be n-butyrate*, $OBe_4(PrCO_2)_6$, was prepd from *n*-butyric acid and $Be(OH)_2$. Extn with C_6H_6 and crystn. from light petroleum yields colorless leaflets, m 25–27°. The low m p renders this compd unsuitable for x-ray investigation J. E. SNYDER

The space lattice and the double refraction of calomel. H MARK AND J STEINBACH. *Z. Krist* **64,** 79 112(1926) – A different structure for calomel is found than that described by Mauguin (*C A* **18,** 2117) The space group is D_{4h}^{17}. The unit cell contains 2 mols of Hg_2Cl_2 and has the dimensions a = 4 45 and c = 10 9 A U The Hg atoms are located at 000, 00¹/₄, ¹/₂¹/₂¹/₂, ¹/₂¹/₂³/₄, and the Cl at 00¹/₂, 00³/₄, ¹/₂¹/₂0, ¹/₂¹/₂¹/₄. A calcn of the double refraction is made L. S. RAMSDELL

The crystal structure of cubic telluric acid. L. MERLE KIRKPATRICK AND LINUS PAULING. *Z Krist.* **63,** 502 6(1926) Telluric acid has a face-centered cubic structure, space group O_h^8. The unit cell contains 32 mols. and the length of the side is 15.48 A. U. The authors consider the formula $Te(OH)_6$ more in harmony with the structure than $H_2TeO_4 \cdot 2H_2O$ L S. RAMSDELL

The crystal structure of solid carbon dioxide. H. MARK AND E. POHLAND. *Z. Krist.* **64,** 113–4(1926) —A new detn of the structure of solid CO_2 gives a value for the distance C – O of from 1 1 to 1 15 A U This is much lower than first reported (*C A*. **19,** 2892) and only slightly above the value of de Smedt and Keesom (*C A* **19,** 1816). L. S. RAMSDELL

Correction: Experiments on crystal growth and solution. M VOLMER AND G ADHIKARI. *Z Physik* **35,** 722(1926); cf *C A* **20,** 1935. F. R BICHOWSKY

Observations and knowledge about the relation between fine structure and optical anomaly. FRIEDRICH RINNE. *Kolloidchem. Beihefte* **23,** 348 54(1926).—A distinction is made between primary and secondary tension of crystals The fine structure formation is due to the former and is the result of the internal energy of atoms and mols The secondary tension is the result of occluded material in the cryst structure. An example of optical anomalies is given with crystals of the mineral, milarite Laue diagrams showing the crystal illuminated in one sector only and again in all sectors equally show that the hexagonal form of crystal appears in both cases. Crystals tempered at a glowing heat show interesting fine symmetrical fissures RAYMOND H. LAMBERT

The surface tension of barium sulfate and gypsum crystals. D. BALAREFF *Z. anorg allgem Chem.* **154,** 170 2(1926) —A discussion of Jones' values for the surface tension of $BaSO_4$ and $CrSO_4 \cdot 2H_2O$ (*C A*. **7,** 2712). It is probable that the values suggested by Jones, 1300 and 1050 dyn./cm., resp., are as much as 10 times higher than the actual figures PER K. FRÖLICH

The physical chemical processes occurring when powders are baked together without melting. J. A. HEDVALL *Z. physik Chem.* **123,** 33–85(1926).—H. has studied the effects of temp , time of heating, size and shape of particle, possible chem reaction and degree of pressure used in forming the pellet on the crushing strength and shrinkage of pellets made of granular Fe_2O_3 from FeC_2O_4 (I), scaley Fe_2O_3 from $FeSO_4$ (II), granular Fe_3O_4 (III) by reduction of Fe_2O_3, scaly natural Fe_2O_3, granular magnetite and mixts of (I) with CaO, SiO_2 and both, (III) with CaO, SiO_2 and both. Measurements were made at 636°, 736°, 836°, 887°, 937°, 1039°, 1158° and 1265°. The curves which represent the change of strength with temp and the decrease of size (shrinkage) with temp. have a characteristic "break" which corresponds to the temp. of recrystn. of the substances The abrupt change in direction of the curves H. designates as the *Knietemperatur* Time of heating has a marked effect at low temps. only. The smaller the size of particle and the greater the pressure applied when making the pellet the firmer will be the product This is especially marked at low temps. in the vicinity of the *Knietemperatur.* Lightly compressed pellets when heated above the temp. of

recrystn. show marked increases in firmness. A diagram of an app. designed to measure crushing strength in kg./sq. cm. is given. E. R. SCHIERZ

A study of the process of unmixing of supersaturated mixed crystals. W. FRAENKEL. *Z. anorg. allgem. Chem.* **154,** 386–94(1926).—The changes in hardness and cond. which take place when a supersatd. mixed crystal gives off its excess have been studied for the system Ag–Cu in an effort to explain the behavior of the Al alloys which harden on aging. PER K. FRÖLICH

The microscopy of borax beads. JOSEF MIKA. *Kolloidchem. Beihefte* **23,** 309–12 (1926).—Borax beads are drawn out into rod-shaped formation and axial microscopic observations are made to determine the sensitivity of the bead reaction. The intensity of color is greater after treatment than for the original bead and the sensitivity increases with decrease in radius of the rod as compared with the original bead. A description of an actual test is given and as low as 0.000005 mg. of cobalt can be measured in a given bead. A table of results accompanies the article. RAYMOND H. LAMBERT

The effect of tension on certain elastic properties of wires. E. EDWARDS, I. BOWEN AND S. ALTY. *Phil. Mag.* [7] **2,** 321–40(1926).—The results of Pealing (*Phil. Mag.* [6] **25,** 418(1913)) on the effect of increasing the tension of metal wires in enhancing their torsional stiffness were confirmed. Phosphor-bronze, single-crystal W wire, and quartz fiber were examd The phenomenon depends on the material having a partly cryst. and partly amorphous structure. The condition is analogous to a chain with a large number of links in 3 dimensions: under small tensions the linking is loose, while increase of tension increases the strength of the connecting bonds. S. C. L.

Crystalline nitrogen. D. VORLANDER AND W. H. KEESOM. *Verslag Akad. Wetenschappen Amsterdam* **35,** 671–6(1926).—Pure N was frozen by means of liquid H under a polarization microscope in 0.2 to 0.3-mm. layer. The first crystals formed (—210°) showed double refraction; soon after the whole mass becomes solid and birefringent a contraction to $^3/_4$ of the original vol. sets in with deformation; on continued cooling (to —253°) the double refraction changes slowly. No isotropic solid state could be observed at any time, contrary to Wahl (*C. A.* **7,** 726, 2897). On heating, the same set of phenomena occurred in reverse order Argon crystallizes in regular form in agreement with Simon and von Simson (*C. A.* **18,** 3128) and de Smedt and Keesom (*C. A.* **20,** 1155). It freezes to a homogeneous isotropic mass, contracting as a whole on further cooling. B. J. C VAN DER HOEVEN

An attempted separation of hafnium and zirconium by the ionic migration method. JAMES KENDALL AND WM. WEST. *J Am. Chem. Soc.* **48,** 2619–26(1926).—By a method previously described (cf. *C. A.* **19,** 2901) K. and W have obtained a sepn. of Hf from Zr by means of a soln. of a complex oxalate. The degree of sepn was not as great as that obtained with other rare earth metals. A correlation of the similarity of the velocities of Hf and Zr ions with at. structure is attempted. E. R. SCHIERZ

Solubility of iodine in chloroform. MALMY. *J. pharm. chim.* [8] **4,** 111–4(1926).—Solubilities calcd. from the equation $y = 1.0384^{5.6t/t}$, in which y = g. of I sol. in 100 g. of $CHCl_3$ at the temp. t, closely agree with the previously obtained exptl. results at $t = 0° - 25°$ (*C. A.* **18,** 1413), and those obtained by Artowski (*Z. anorg. Chem.* **11,** 276(1895–6)) for t = —75° to —19°. Solubilities for intermediate temps. are also calcd. However, at 0°, y = 1.237 (calcd.), not 1.314 as previously stated. Re-detn. of y showed at —1° 1.198, at +0.5° 1.267. S. WALDBOTT

Critical temperature of mercury. L. A. SAYCE AND H. V. A. BRISCOE. *J. Chem. Soc.* **1926,** 957–8.—An attempt to det. approx. the crit. temp. of Hg was made by fusing the Hg in a transparent silica tube having a bore of 2 mm. and a wall thickness of 3 mm This tube was placed in an elec furnace and exploded at a temp. above 1000° at which temp. the liquid phase was still present. A. W. KENNEY

Molecular fields of hydrogen, nitrogen and neon. J. E. LENNARD-JONES. *Proc. Roy. Soc.* (London) **112,** 214–29(1926).—The recent data on equations of state and viscosity of Ne and H_2 are used to calc. the laws governing the respective mol. fields. The results of the 2 methods are in good agreement. For N_2 this agreement is not good. A table is given summarizing the present knowledge about the mol. fields of He, Ne, A, Kr, Xe, H_2 and N_2. A. W. KENNEY

Methods for studying effusion of gases. HERBERT WEIDE AND F. R. BICHOWSKY. *J. Am. Chem. Soc.* **48,** 2529–34(1926).—Methods based on the law of effusion of gases may be applied to measure high temps. (with gases which do not dissociate) or to measure the degree of dissocn. of gases that dissociate. Preliminary measurements for I_2 = 2I give log K_p = 3.7 at 915° K. F. R. BICHOWSKY

Gas, vapor and liquid. H. v. JÜPTNER. *Feuerungstechnik* **13,** 147–8, 160–2, 172–4, 196–8, 222–3(1925).—J. discusses the departure of several substances from the perfect

gas laws and van der Waals' equation, as exhibited in published data, in great detail and from various points of view. He concludes that the deviations observed near the crit. point and in nearly satd. vapor are due to the formation of "condensation nuclei," very small regions of higher d., which arise from the random motion of the mols.
ERNEST W. THIELE

Aberrations from the ideal gas laws in systems of one and two components. O. MAASS AND J. H. MENNIE. *Proc. Roy. Soc.* (London) **110A**, 198–232(1926).—An app. is described in which gas d. measurements can be carried out with an accuracy of at least 0.1% at temps. up to 200° and pressures up to 1 atm., either on a 2-component mixt. or on a single substance, whether liquid at room temp. or not. The d. of CO_2 was measured with an accuracy of 0.05% at pressures up to 1 atm. and over the range —70° to 200°. The method was a modification of that described by Maass and Russell (*C. A.* **13**, 87), consisting essentially of observing the pressure of the gas contained in a known vol (about 1 l.) maintained at a known temp., condensing the gas by means of liquid air into a small glass bulb, sealing off the bulb, weighing it, and then weighing the bulb empty. The "apparent mol. wt." of CO_2, as calcd. from the measurements by the formula $M' = m(RT/pv)$, varied from 44.107 for 99.9° and 563.1 mm. to 44.804 for —70.2° and 725.4 mm. The relation between pressure and apparent mol. wt. at const. temp. was found to be linear up to 760 mm. pressure. The interpolated values for 760 mm. and rounded temps. are: 200°, $M' = 44.06$; 160°, $M' = 44.08$; 120°, $M' = 44.11$; 80°, $M' = 44.16$; 40°, $M' = 44.22$; 0°, $M' = 44.34$; —40°, $M' = 44.57$; —70°, 44.84. The corresponding ds. can be calcd. by the equation $d = M'/RT$. Instead of regarding, as van der Waals did, the effect of mol. vol. on the total vol. occupied by a gas, its effect on the pressure registered by a manometer is considered. From this point of view a new *equation of state* for gases, $pV^2 - RTV + a - RT\beta[1 + (c/T)] = 0$, is derived, where c is Sutherland's const. in his viscosity formula $\eta/\eta_0 = (T/273)^{1/2}\{[1 + (C/273)]/[1 + (c/T)]\}$ and β is calcd. by the equation $(8\sqrt{2}\pi r^3 N)/[1 + (c/273)] = \beta$. In this last equation r is the radius of the mol., and N the no. of mols. in the vol. V. a of the quadratic equation of state is a const. calculable from a single observation of the d. The quadratic equation holds for CO_2 over the temp. range for which Sutherland's mean free path equation holds. The "b" of van der Waals' equation is shown to be a function of the temp., $b = \beta[1 + (c/T)]$, and is related to the mean free path. In detg. the d. of H_2O, the reverse procedure was followed. A weighed amt. of H_2O was introduced into a known vol. at known temp. and the corresponding pressure was observed. The d. of H_2O was measured in this way with an accuracy of 0.1% at pressures up to 1 atm. and over the temp. range 98° to 200°. The observed apparent mol. wts. of H_2O varied from 18.033 at 199.9° and 403.7 mm. to 18.315 at 98.3° and 704.2 mm. The relationship between the observed pressure and the apparent mol. wt. at const. temp. was not linear. The results also showed greater divergence from the "ideal" gas d. than can be accounted for on the basis of the new equation of state. The hypothesis of polymerization according to the equil. $2H_2O \rightleftarrows (H_2O)_2$ is adopted. A sharp distinction is drawn between association and the equation of state effect, but an exact calcn. of the 2 effects from the data is not possible. The approx. degree of association at about 100° and 1 atm. is of the order of 0.9%. The apparent mol. wt. of NH_3 at 760 mm. was detd. as follows: t = 98.1°, M' = 17.136; 107.8°, M' = 17.131, 125.9°, M' = 17.127; 148.5°, M' = 17.114; 180.5°, M' = 17.091; 199.9°, M' = 17.073. Measurements of the total pressure of about 1 atm. exerted by approx. equimol. mixts. of $CO_2 + H_2O$ and $NH_3 + H_2O$ were made at temps. between 98° and 200°. The mutual attraction of the components, as shown by the difference between the observed total pressure and that calcd. by Dalton's law, was relatively small. In the case of $CO_2 + H_2O$, the difference was about 1 mm. at 98°. With $NH_3 + H_2O$ the difference was about 6 mm. It is concluded that the highly polar character attributed to H_2O is a property of the $(H_2O)_2$ mol., while (H_2O) is relatively non-polar. R. L. DODGE

Studies in vapor pressure. II. The mononitrotoluenes. J. F. T. BERLINER AND ORVILLE E. MAY. *J. Am. Chem. Soc.* **48**, 2630–4(1926); cf. *C. A.* **19**, 2935.—*o*-, *m*- and *p*-$O_2NC_6H_4Me$, b. 220.38°, 231.87° and 238.34° (760 mm.). The vapor pressures of the 3 compds. have been detd. from 50° to a few degrees above their resp. b. ps. The heats of evapn. for the 3 derivs. are 11,246, 11,990 and 11,945. Log p for the 3 derivs. is: $7.97285 - 2513.0/T$; $8.06553 - 2618.2/T$; $7.98149 - 2608.9/T$ (T on abs. scale); the pressures calcd. from these equations agree well with the observed values. The entropies of vaporization at a concn. of 0.30507 moles per l. indicate that the molten $O_2NC_6H_4Me$ are normal liquids. C. J. WEST

The vapor pressures and thermal properties of potassium and some alkali halides. E. F. FIOCK AND W. H. RODEBUSH. *J. Am. Chem. Soc.* **48**, 2522–8(1926).—Physicists

calc. electron displacements and energy changes as though chem. reactions were merely electron transferences from one atom to another. The thermal data of chem. reactions are not known with sufficient accuracy to check the electron affinity data of the physicist. Thermal data for alkali metals and alkali halides are especially desirable. These data were secured by the method of Rodebush and Dixon (cf. *C. A.* **17,** 3445; **19,** 1807). Nine tables of data give vapor pressures of K, NaCl, KCl, KBr, KI and CsCl, deviation of calcd. values from observed values, and heats of sublimation at 298° K. for NaCl, KCl, KBr, KI and CsI. There is a parallelism between heat of sublimation, lattice energy (Born) and heat of soln. of gaseous ion in H_2O. There is strikingly little heat of soln. of solid alkali halides, which indicates about the same extent of elec. neutralization in soln. as in the lattice structure. The extremely small heat of sublimation must mean that the one bond in the vaporized mol. changes so that it represents nearly as much energy as all of the lattice bonds did before sublimation. F. E. Brown

The vapor pressure of ozone at very low temperatures. Anna Lise Spangenberg. *Z. physik. Chem.* **119,** 419–38(1926).—The vapor pressure of O_3 has been detd. between —193° and —183° by a kinetic and by a static method, the results of which agree with one another and are consistent with the results of Beja at higher temps. The equation, $\log p = -(3700/4.571\ T) + 1.75 \log T - (0.05099\ T/4.571) + 5.850$, represents the results where p is in mm. Hg. This equation is consistent with the b. p. of O_3 detd. by Riesenfeld and Schwab. Mol. heat of vaporization at 0° abs. is calcd. as 3700 cal.; at the b. p. as 2955 cal. The conventional chem. const. for O_3, if the pressure is in atm., is 2.97. A. W. Kenney

Completion of B. Baule's "Theoretical treatment of the phenomena of dilute gases." Theodor Sexl. *Ann. Physik* **80,** 515–23(1926).—The statistical method of Baule (*Ann. Physik* **44,** 145(1914)), is applied to the calcn. of diffusion and to the theory of the radiometer. F. R. Bichowsky

The rate of flow of various gases through a porous wall. Jutsusaburo Sameshima. *Bull. Chem. Soc.* (Japan) **1,** 5–8(1926).—The rate of flow of gases through a porous plate does not follow Graham's law. The equation $t = K\eta^n M^{(1-n)^2}$ is proposed, where t is the time, N the viscosity and K and N ($n < 1$) are empirical consts. which do not depend on the kind of gas. Expts. with CH_4, NH_3, C_2H_2, C_2H_4, O_2, CO_2 and H_2 fit the equation at pressures from 1.0 to 2.5 atm. to within 1%. F. R. Bichowsky

The effect of temperature on the viscosity of air. F. A. Williams. *Proc. Roy. Soc.* (London) **110A,** 141–67(1926).—With regard to the dependence of viscosity of a gas upon the temp. the kinetic theory of gases gives different results for different mol. models. The detn. of the temp. coeff. of viscosity can therefore be of service in the elucidation of mol. forces. The temp. coeff. of viscosity of dry air, free from CO_2, was detd. at temps. between 15° and 1002°. A comparative transpiration method was used. A known vol. of air was displaced by means of Hg from a glass bulb in a thermostat. The air transpired through a silica capillary, heated in an elec. furnace, and thence into the free atm. The pressure in the glass bulb was controlled by the rate of flow of Hg into the bulb. A comparison of the time required for equal vols. of air to transpire through the capillary under the same driving pressure gave comparative viscosities of air at the different temps. The capillary const. was detd. at room temp. with air, accepting as the known viscosity of air, at 12° to 23°, Millikan's value, $\eta_t = 0.00018240 - 0.000000493\ (23° - t)$ (cf. *Ann. d. Phys.* **41,** 759(1913)). Sutherland's formula, $\eta_{T_1}/\eta_{T_2} = (T_1/T_2)^{1/2}.\{[(1 + C)/T_2]/[(1 + C)/T_1]\}$ was found to hold with great accuracy between 250° and 1000°. η_{T_1} and η_{T_2} are the viscosities in C. G. S. units at the abs. temps. T_1 and T_2, C is a const. The value of C for this range is 172.6. Below 250° the value of C decreases as the temp. decreases, and Sutherland's law no longer holds. A crit. discussion of previous work on the viscosity of gases is included. R. L. Dodge

The thermal conductivity of air and hydrogen. Ernst Schneider. *Ann. Physik* **79,** 177–203(1926).—The thermal cond. of air and H_2 are calcd. from the measured heat loss of a filament, corrections being made for temp. gradient along wire, radiation and convection. Pressures ranging from 0 to 600 mm. Hg were used and temps. from 0° to 50°. The cond. K_0 (air) $= 2.477 \times 10 + 0.00390t$; K_0 (H_2) $= 17.52 \times 10 + 0.00\ 67t$ watt per cm. per degree ±0.2%. F. R. B.

Decomposition of mixtures. Principle of physical substitution in the gaseous phase. Giovanni Cicali. *Giorn. chim. ind. applicata* **8,** 171–4(1925).—The purpose was the economical prepn. of H. With regard to various H-CO mixts., whatever liquifying procedure may be adopted and whatever path pursued, the % of CO present in the issuing H is invariably related to the final state reached by the mixt. The purity

of the H depends upon the final conditions practically attainable. The addn. of CO directly to water gas makes worse rather than improves the economic effect and the final effect of purification (since the loss of H and the work of compression increase). The washing of the rising gaseous phase by the liquid continually condensed (in the indirect return) never succeeds in giving H free from CO, even if (as Claude suggested in 1921) N is added instead of CO directly to the water gas or similar gas before subjecting the mixt. to partial liquefaction. It is more economical to limit the previous purification of the water gas to 5 6% of CO, then to introduce at once into the cooled mixt. under pressure a suitable amt of N to make a mixt. physically similar to water gas. ROBERT S. POSMONTIER

The volatility and fuming of a series of organic materials. H. HERBST. *Kolloidchem. Beihefte* **23**, 313-41(1926) – Four methods of detg. volatility are given, *i. e.*, an isomeric, the static, a dynamic, and a b. p. or a vapor pressure method. If Trouton's rule is used for the b p method the Nernst modification of that rule holds very well for the Hg type vapor Other types do not hold at all. A table of about 90 compds. includes the state of the material at room temp, the m p., the b. p calcd. and observed, the volatility by the b p. and vapor pressure measurements in presence of inert gas, the relative solubilities in water and the concns. necessary to produce death A graph of b p. plotted against volatility shows curves of various types of material. R. H. L.

A differential method for the measurement of the vapor pressure of liquids. V. G. JOLLY AND H V. A BRISCOE *J. Chem. Soc.* **1926**, 2154 9.—By sealing up a liquid, free from gas, in a simple U tube and then observing the difference in level between the liquid in the two limbs maintained at different const temps data were obtained on the vapor pressures of H_2O, C_6H_6 and Br_2 from 15° to 50°. The values for one temp. were taken from the literature for reference. The values obtained agree with those of other investigators. E. R SCHIERZ

Preparation of dust-free liquids by distillation. J D. GARRARD *Trans. Roy. Soc. Canada* [iii] **18**, III, 126–7(1924) —An investigation of the conditions under which dust-free water may be obtained by distn in a vacuum without ebullition shows that, provided "bumping" be avoided, neither the temp. of distn nor the temp difference between the 2 bulbs employed as distn vessel and receiver has any appreciable effect on the no of motes in the distillate, and the distn bulb may safely be taken to complete dryness "Steaming-out" is the most satisfactory method of cleaning prior to filling Detns of the scattering of light in water prepd. in various types of glass show that whereas the use of soft soda, Pyrex, or Jena ware yields sensibly identical values, water obtained in lead-glass app. has a scattering power 20–40% higher The dust-free water is invariably contaminated with particles on shaking even after agitation, rinsing back and redistg. as often as 20 times B. C. A.

The polarization of a medium and its molecular structure. Examples of benzene and cyclohexane. J ERRERA. *Bull. sci. acad. roy Belg* **12**, 327-39(1926); cf. *C. A.* **20**, 3124.—The total mol. polarization is made up of a no. of polarizations such as those of the electron, the atom, the ion, etc., which are approx. additive This polarization is directly related to the sp inductive capacity, the mol wt, and the d. If the substance studied has a permanent dipole there is an abrupt change in the sp. inductive capacity in passing from the liquid to the solid state. This is found to be the case for water. No permanent dipoles exist for either benzene or cyclohexane A special app. described eliminates errors previously found by others. The change in sp. inductive capacity of water with temp is given for various frequencies of elec. current. R H L.

A new method for quantitative extraction of liquids. E. M. P. WIDMARK. *Skand. Arch. Physiol.* **48**, 61 71(1926) —The principle of the method is the continuous streaming of the extg. solvent between the soln. to be extd. and a soln. in which the substance is transformed into a form insol in the solvent. This does away with the necessity of distg the extg. solvent. The method also secures several important advantages. The extn is carried out in a specially devised double separatory funnel. This can be made of different sizes, is mounted in a rocking app. which carries a number of these extractors and which permits the regulation of the degree of incline from the horizontal position as well as the number of movements per min. The 2 separatory funnels communicate through a channel In one separatory funnel is placed the liquid to be extd (*e. g*, succinic acid + H_2SO_4), in the other the soln which takes up the extd. substance (*e g*, 0.1 *N* NaOH), while the extg. solvent (Et_2O) is poured over these so as to form a layer passing through the communication tube. Studies of the rate of extn. of benzoic acid with toluene have been thus made, varying the speed of motion and the degree of inclination. The velocity of extn. of the benzoic acid is proportional to the concn. of the acid not yet absorbed by the alkali, and with the aid of velocity const.

the theoretical time necessary for complete extn. can be calcd. Titration also can be made directly in the receiving vessel. S. MORGULIS

Molecular association and the equation of state. M. F. CARROLL. *Phil. Mag.* [7] **2,** 385–402(1926).—A comparison of the value of x (the ratio of the actual to the ideal mol. wt.) at the b.-p. shows that the ratios x_g/x_c and x_l/x_c are approx. const. for all substances. In other words, the law of corresponding states applies also to the degree of association. Hence any law based on corresponding states should include reference to the degree of association. Thus, with Trouton's rule, the "normal" substances which give a const. approx. equal to 21.0 cal./ deg. are precisely those which have approx. the same reduced mol. vol. and mol. ratio x at the b. p., and the other consts. in the latent heat equation are also approx. equal. Therefore Trouton's rule should be modified to include some function of a In this connection it is interesting to note that Longuinine shows that, if in the case of fatty acids the double mol. wt. is used in calcg $\lambda = ML$, the same value is obtained for the const. in Trouton's expression as for the "normal" substances This may be expressed by writing $(\lambda/T).(1/x) = C$, where x is defined above This correction is, however, too empirical, and any attempt to modify Trouton's rule must take into account some function of a for both the liquid and gaseous states The rule of Eotvos may be treated in a similar manner. Thus the "normal" substances give a value for the const. A = —2.11. Allowing for association, $d.\gamma(Mv\ x)^{2/3}/dT = A$. Substituting a mean value of α = 0 80 for the "normal" substances at the b p, for the ideal associated state; $d.\gamma(Mv)^{2/3}/dT$ = —2.44. From the rule of Eötvös for H_2O, which is a typical associated substance, at the b p. x = 1.7 approx From the value of A = 2 44, x = 2 1 approx., whereas the value of x deduced from the law of corresponding states is about 2.3. This assumes that x does not vary appreciably over the range used in calcg. the const of the expression, but, as shown in the tables above, this assumption is true over a range of about 10–20°. The application of the equation of state to the calcn of the degree of association of the "abnormal" substances must be deferred until the variation of the consts. a and b of van der Waals' equation, with the degree of association, has been further investigated and placed on a more exact basis S. C. L.

Studies in surface tension. OTTO FAUST. *Z. anorg. allgem. Chem.* **154,** 61–8 (1926) - The surface tension of various liquids and mixts of liquids has been detd. accurately. When the vapor pressure is a straight-line function of temp. it is found that the surface tension, and usually also the viscosity, change linearly. For nonlinear relation the surface tension follows the viscosity curve, deviating in the opposite direction from the vapor pressure. By dividing the abs. temp. at which a liquid has a surface tension of γ = 30 by its abs. crit temp, a nearly const. value—av 0 47—is obtained The rule holds for liquids the 2 temps. of which do not fall far apart. PER K. FRÖLICH

The ring method for the determination of surface tension. WILLIAM D. HARKINS, T. F YOUNG AND LAN HUA CHENG *Science* **64,** 333–6(1926).—Calcn of surface tension by the ring method by the simple equation $mg = 4\pi R\gamma$, where mg = dynes to balance the max pull of the film, R = radius of ring to the center of the circular wire and γ = surface tension in dynes per cm., may be in error by 25% or more Correct values are given by the equation $mgF = 4\pi R\gamma$, where F is a correction factor easily detd. by expt. Preliminary values of F were detd by comparing γ for various liquids by capillary-height and drop wt. methods with the values by the ring method. Exptl. precautions required for precise work are enumerated. E. R. SMITH

The surface tension of liquid metals. I. Tin and lead. L. L. BIRCUMSHAW. *Phil. Mag* [7] **2,** 341-50(1926) - By the method of "max. bubble pressure" the surface tensions of liquid Sn and of liquid Pb have been detd. between the m. ps. and 1000°. The values at lower temp. agree with those of Hogness (*C A*. **16,** 181), but the temp. coeff of surface tension for Sn obtained by H. was not confirmed. Probably both metals are highly associated in the liquid state. S. C. L.

The fine structure of the surface layers and the dependence upon temperature of the surface tension of pure dielectric liquids. GERHARD JUNG. *Z. physik. Chem.* **123,** 281–302(1926).—A theoretical paper relating orientation in the surface layers of polar liquids and polarizability with critical data. With non-polar substances the polarizability rises linearly with critical temp. The total surface energy of substances with small polar moment is independent of temp., and an additive function of the components. A. W. FRANCIS

Further note upon intertraction. A. E. WRIGHT. *Proc. Roy. Soc.* (London) **100B,** 268(1926).—Intertraction is a reciprocal instreaming which occurs when 2 liquids of different sp. gr. are in contact with each other. It may occur in a horizontal direction,

e. g., a piece of filter paper is satd. with serum colored with an aniline dye, then floated on hypertonic (4.5%) NaCl soln.; horizontal streamers then spread from the edge of the filter paper. JOSEPH S. HEPBURN

The theory of "structure turbulence." MARKUS REINER. *Kolloid-Z.* **39,** 314–5 (1926).—The formulas, $R_0 = 2\eta\sqrt{K/\rho T}$ and $V_0 = {}^1/_2\sqrt{KT/\rho}$, are derived from consideration of the equations of Reynolds and of Poiseuille, in which R_0 is the radius of the largest tube from which turbulent flow occurs, η is the viscosity of the liquid, K is a const. for each liquid, ρ is the density of the liquid, V_0 is the velocity of flow above which turbulence appears and T is the shearing strength. Structure turbulence requires both crit. velocity and a sufficiently small tube. $T = k/\delta$, where δ is the flowing strength. Solid bodies are brittle when the T is smaller than δ and plastic when T is larger than δ. F. E. BROWN

The structure of thin films. VIII. Expanded films. N. K. ADAM AND G. JESSOP. *Proc. Roy. Soc.* (London) **112A,** 362–75(1926); cf. *C. A.* **20,** 1542.—Expanded films of fatty acids, bromo acids, esters, methyl ketones and other compds. possessing one chain only in the mol., and of several compds. with more than one chain have been reinvestigated. Two types of expanded films exist—(1) the liquid-expanded, which exhibits a const vapor pressure in the surface, and a discontinuous transition into the "gaseous" film; and (2) the vapor expanded, which passes continuously into the gaseous film The liquid-expanded films show a definitely limited area at no compression, of about 48 (A. U.)^2 per mol., and is independent of the nature of the head and length of the chain, for the substances studied. The vapor-expanded films have no limiting area; as the temp. is increased and the pressure decreased they approach the gaseous state Some of these vapor-expanded films have pressure-area curves that resemble those of liquid-expanded films. The structure of liquid-expanded films is envisaged as long chains coiled in helices with a vertical axis, the mols of which are closely packed by mutual cohesion. Two-dimensional evapn. in the surface is a sepn. of the mols, followed by an uncoiling and flattening of the helix. The liquid-expanded state can exist only when there is sufficient adhesion between the mols. in the coiled state. The esters and the ketones form only vapor-expanded films, while the acids and most of the other compds form only liquid-expanded films. Acid $KMnO_4$ in the H_2O acts on ethylenic bonds in the middle of the chain so as to make the films gaseous, which would otherwise be either condensed or far from the gaseous state, if the $KMnO_4$ were absent. $KMnO_4$ does not affect satd. chains or those in which the ethylenic linkage is next to the head of the mol. This effect is explained by assuming that the extra attraction on the middle of the chain causes the mol. to lie flat. Methyl ketones form condensed films with closely packed chains, the heads of which pack to less than 21 (A. U.)^2. Hydrolecithin shows a lag in reaching its final pressure in the films. This hysteresis may be ascribed to the slowness of the mols. in assuming their final packings. **IX. Dibasic substances.** *Ibid* 376–80.—Dibasic esters of the type $C_2H_5OOC(CH_2)_nCOOC_2H_5$ form monomol. surface films of the gaseous and condensed types. The cohesional correction to the gaseous films increases with the length of the chains, the films of the esters in which n is 10 and 11 approaching most closely to the perfectly gaseous state yet found with insol. films In the condensed films the only stable state is that with the mols. adhering to the H_2O by one end only and packed closely in a vertical position. J. H. PERRY

The spreading velocity of oil on water. E. LANDT AND M. VOLMER. *Z. physik. Chem.* **122,** 398–404(1926).—Talcum powder was sprinkled on water in a circular basin of known dimensions and a drop of olive oil (2 to 3 mm. diam.) placed on the surface at the center by means of a capillary. The powder was driven out, concentric to the edge of the basin, with the spreading of the drop. Photographs showing the position of the spreading circle were taken at the rate of 160 per sec. and from the scale of the pictures the velocity of spreading was found. The velocity decreased rapidly at the start but less rapidly as the radius increased. The force per cm. producing the spreading is given by the difference between the surface tension of water and the sum of the surface tensions of the interfaces water-oil and oil-air. The conception is that the water layer in contact with the oil is carried along with the oil and the resistance to spreading and the velocity decrease are due to internal friction of the water. The friction on the air side can be neglected. Theoretical considerations lead to the formula $u = 42.8/\sqrt[3]{L}$, where u is the velocity in cm./sec. and L is the radius. The agreement between measurement and calcn. shows that the mechanism of spreading is interpreted correctly. The theory is also considered valid for adsorption layers on solid surfaces provided the force is expressed as a variable according to an equation of state for adsorbed substances. E. R. SMITH

The effect of surface-active substances on the diffusion of water through membranes. S. A. P. Ederer. *Proc. Soc. Exptl. Biol. Med.* **23,** 66–8(1925).—With the electrolytes NaCl, Na_2SO_4, Na citrate, and $K_4Fe(CN)_6$, the diffusion of water into collodion sacs was increased by surface-active substances. The substances causing this phenomenon were caproic acid, methylamine, ethylamine, theobromine-sodium salicylate, Na oleate and Na glycocholate. In the case of $CaCl_2$ soln. in sacs previously treated with Na glycocholate, H_2O diffused from the electrolyte soln. into the distd. H_2O. Repeated and long-continued washing of the membranes tended to decrease the negative osmotic effect. The effect cannot be explained on the basis of valency alone as Al salts fail to exhibit the phenomenon. C. V. B.

Surface energy. Mituo Yamada. *Science Reports Tôkoku Imp. Univ.* **15,** 323–30 (1926); cf. *C. A.* **19,** 756, 2286.—Y. has extended his work to the regular tetrahedron, the surface energy of a boundary between two substances and edge energy. E. R. S.

Studies in adhesion. William Hardy and Millicent Nottage. *Proc. Roy. Soc.* (London) **112A,** 62–76(1926).—The normal pull required instantaneously to sep. a cylinder, standing in a pool of lubricant, from a plate is taken as a measure of the identifiable adhesion. To be identifiable, however, it is necessary for the cylinder, plate and lubricant to be in a mechanically "corresponding relation." One such value, known as the "*A* value," is obtained when the load is in equil. with the Leslie pressure. If the cylinder is placed on the plate and lubricant added equil. is reached in a few secs. The layer of lubricant is hundreds or even thousands of mols. thick. The latent period before the adhesion attains a steady value is zero for octane and *p*-cymene and a max. for acids like caprylic acid. The *A* value of the adhesion is probably not a measure of the tensile strength of the lubricant but rather a measure of its viscosity, the time being arbitrarily fixed by the term instantaneous. It is found that the coeff. of adhesion (A/load) decreases as the load increases. The value of A depends upon the nature of the solid, being glass > steel > Cu; it is directly proportional to the mol. wt. of the lubricant; and it decreases in a linear manner with the temp. Eugene C. Bingham

Adhesion forces in solution. VII. Adsorption of substances from dilute aqueous solutions. Michael Dubinin. *Z. physik. Chem.* **123,** 86–98(1926); cf. *C. A.* **20,** 1009.—The adsorption isotherms of HCl, HBr, HI, HNO_3, $HClO_3$, HPO_3, HIO_3, KCl, KI, KIO_3 in solns. 0.001–0.003 *N* form a family of curves which is detd. by a single parameter. The adsorption isotherms of nonelectrolytes, glucose, HCN, H_3AsO_3, are only slightly convex to the axis abscissas and show a regular increase of adsorption with increase in concn. They form a family of analogous curves which differ markedly from those of the strong electrolytes. The curves of the weak electrolytes, HCOOH, AcOH, lactic acid, belong to the family of nonelectrolytes, which indicates that the adsorption is concerned with mols. and not ions. The acids H_2SO_4, H_2SeO_4, $H(H_2PO_4)$, yield isotherms similar to those of the strong electrolytes. The adsorption from soln. containing HCl + AcOH yields an isotherm which is transitional between those of strong electrolytes and non-electrolytes. E. R. Schierz

Plasticity. A. de Waele. *Kolloid-Z.* **38,** 27(1925); cf. *C. A.* **20,** 3109.—The extrusion of an heterogeneous system through a capillary orifice under pressure comprises a combination of 2 regimes, *i. e.*, that of the shear of the continuous phase resulting in a velocity gradient within it, and mere extrusion of accompanying unshearable disperse phase not susceptible to a velocity gradient. By deriving the empirically obtained proximate equation for the "shear" of an heterogeneous system through a capillary from these principles, ψ in the equation $P/V\psi$ = const., is shown to denote the vol. proportion of shearable, truly viscous phase. Many, if not all heterogeneous systems show in addn. evidence of a static elasticity or yield value (f), the actual resultant of which is, however, variable in magnitude with the stress applied, thus: yield value at any moment $(F) = fe^{-\text{stress}}$, where c = log base. This static-yield value is recoverable on rest according to the relationship: $F = fe^{-\eta/t}$. The complete equation showing the discontinuity in capillary shear owing to loss of yield value with stress then is: $\pi gR^4(P - fe^{-PR/2l})/8V\psi l = \eta$. The mechanism of this deflocculation on shear and re-flocculation with subsequent rest is suggested as being de-orientation and re-orientation, resp., of mols. of the viscous phase at the boundary surfaces of the unshearable phase. B. C. A.

Viscosity of ammonium oleate solutions. E. Hatschek and R. S. Jane. *Kolloid-Z.* **38,** 33–42(1926).—The viscosity of very dil. NH_4 oleate solns., showing a decided shear elasticity, has been measured in a self-recording Couette viscometer. With fresh solns., *i. e.*, solns. not sheared too energetically or for too long a period, the inner cylinder did not achieve a position of rest for a const. angular velocity, but its deflection increased, often only after many revolutions, up to a distinct max. and thereafter fluc-

tuated considerably; maxima recurred periodically and often reached after 40–50 revolutions the full value of the first max. If a fresh soln. were gently sheared or shaken for a short time and then allowed a brief rest, it generally showed a marked increase in the apparent viscosity, which was succeeded by the fluctuations described above, showing that no permanent effect had been produced. Shearing for long periods at high velocities or energetic stirring produced, however, a fundamental change. At low angular velocities, the viscosity was now const. as with normal solns., and over a wide range of velocities was independent of the shear gradient. Further, it was little higher than that of water. At higher velocities, the viscosity increased very suddenly, reaching values many times those measured at the low velocities B. C. A.

Hydrodynamic behavior of ammonium oleate solutions. E. N. Da C. Andrade and J. W. Lewis. *Kolloid-Z.* **38,** 260–1(1926); cf. Hatschek and Jane, preceding abstract.—An app. described, in which the movements of a liquid are observed between 2 cylinders which move coaxially relatively to each other at known speeds, has been employed to investigate the anomalies described by Hatschek and Jane, using ammonium oleate solns. Small index particles of metallic Al are suspended in the soln., and their movements are observed through a microscope, the inner cylinder only being rotated. At a certain critical angular velocity, the circular stream-line motion ceases and vibratory movements commence, followed by the appearance of turbulence, which is indicated by the formation of circular vortices in the liquid. The velocity at which turbulence commences is about $^2/_3$ of that calcd. for homogeneous liquids by means of Taylor's formula. It is thus reduced in the required ratio 80 : 120 (cf. following abstract). The crit. velocity is susceptible to previous mech. treatment of the soln., and Hatschek and Jane's anomalous observations are thus confirmed and explained as due to turbulence. B. C. A.

Apparent increase of viscosity of ammonium oleate solutions at higher velocities. E. Hatschek. *Kolloid-Z.* **38,** 259(1926).—With reference to the observations of Hatschek and Jane on the increased viscosity of vigorously sheared ammonium oleate solutions at angular velocities from 70° to 90° per sec., attention is directed to the work of Andrade and Lewis (cf. preceding abstract). Turbulence does not set in with water until an angular velocity of 120° per second is reached, but Andrade and Lewis have detected turbulence in these solns. at lower shear gradients than is the case for water, so that the phenomena observed may be explained on this ground B. C. A.

Specific gravity determinations for solids. W. H. Seamon. *Eng. Mining J.* **122,** 537(1926).—Accurate detns. may be made by filling a graduated glass cylinder to a definite mark with a liquid not affecting the solid to be tested and a weighed quantity of the solid in small pieces is added and the increase in vol. in cc. noted. Wt sample/cc. increase = sp. gr. W. H. Boynton

Density of boric oxide from a fractional crystallization of boric acid. H. V. A. Briscoe, P. L. Robinson and G. E. Stephenson. *J. Chem. Soc* **1926,** 954–5.—End-fractions of boric acid resulting from a fractional crystn. involving about 1150 crystns were fused to glass and their ds. detd. as $d^{18}_4{}^{18}$ = 1.79415 and d_4^{19} = 1.79445 for head and tail fractions, resp. The corresponding relative at. wts. are 10.790 and 10.796. No significance is attached to the slight difference. A. W. Kenney

The derivation of a logarithmic mixing rule by the Maxwell-Rayleigh method. Karl Lichtenecker. *Kolloidchem. Beihefte* **23,** 285–91(1926).—All material properties of a vectorial nature, such as dielec. const., n, permeability and heat cond. of binary mixts. are shown to follow the logarithmic mixing rule: $\log W = \Theta_1 \log W_1 + \Theta_2 \log W_2$ for all values of Θ from 0 to 1. W is a function of the property and Θ is the partial vol. R. C. Newton

Hysteresis in sedimentation. I. B. Iljin *Z. physik. Chem.* **122,** 137–48(1926).—Suspensions of (1) rice starch with ammoniacal $Cu(OH)_2$ added, (2) wheat starch with NaOH added and (3) blood albumin with EtOH added were studied. The rate of pptn. was detd. by measuring the height of the ppt. after centrifuging under standardized conditions for varying intervals of time. The hysteresis resulted from the change in velocity of pptn of the suspension or colloidal soln., according to whether the velocity was measured immediately after mixing the suspension and the "sedimentator" or at the end of a time interval after mixing. In some cases, *e. g.*, (1), the change in velocity of pptn was evidently conditioned upon a parallel-running process of irreversible adsorption; in other cases the soln. processes and other changes at the surface between the suspended particle and the dispersion medium played an important role. H. M. McLaughlin

The structure of solid colloids. J. Duclaux. *2ième Cons Chim. Inst. Intern. Chim. Solvay* **1926,** 91–123.—A crit. review of the work done to date on the birefringence

and x-ray investigations of nematic solid colloids (see Friedel, *C. A.* **17,** 3267–8). As the greater portion of the work along these lines has been carried out on *cellulose* and its derivs., the article is concerned mainly with them. D. gives the results of some of his as yet unpublished expts., which show that both nitrocellulose and cellulose films have the properties of a uniaxial crystal cut perpendicular to its axis and that whatever be the conditions under which the film is formed (nature of solvent, thickness of film within limits of 0.04–0.4 mm., time of drying, compn. of denitrating bath) the birefringence remains const. within the exptl. error. D. concludes that cellulose in a normal condition can be likened to a uniaxial crystal, and that the biaxial varieties are oriented varieties. The article is followed by an 11-pp. discussion which took part Staudinger, Barger, Jaeger, Bragg, Mauguin, Swarts and E. F. Armstrong. A. PAPINEAU-COUTURE

Thomas Graham's characteristics of the colloid condition. P. P. VON VEIMARN. *Kolloid-Z.* **39,** 172–3(1926); cf. *C. A.* **20,** 866. F. E. BROWN

The effect of dry grinding upon gels. C. L. ALSBERG AND E. P. GRIFFING. *Proc. Soc. Exptl. Biol. Med.* **23,** 142–3(1925).—Gelatin is rendered largely sol. in cold water by dry grinding in a pebble mill; the soln. sets to a gel after a time. Prolonged grinding did not affect the soly. of gliadin and glutenin. Ground gluten exhibited less swelling in acid than the unground substance. Mild mechanical treatment affects profoundly the physical properties of gel-forming colloids. C. V. B.

The modulus of shearing and the relaxation of some sols. EMIL HATSCHEK AND R. S. JANE. *Kolloid-Z.* **39,** 300–13(1926).—The modulus of shearing was detd. for each of a no. of sols of gelatin, NH_4 oleate, Hg, Ag sulfosalicylate, cotton yellow, and benzopurpurin by the method of Schwedoff. In all cases except that of NH_4 oleate the modulus of shearing increased with the age of the sol, and in all cases it fell sharply with rise in temp. At 40–50° the sols investigated had almost no measurable shearing elasticity. In a no. of cases the relaxation time of Maxwell was detd. From the relaxation time and modulus of shearing, the coeff. of viscosity was calcd. The values of these coeffs. were between 10^2 and 10^4 abs. units. From the decrease of tension in the wire with time, the viscosity coeff. was calcd. These values were in agreement with those calcd. by the formula of Maxwell. The elasticity of a sol is a function of its history; for instance, benzopurpurin sols prepd. in the cold had no elasticity and low viscosity, while those of the same concns. prepd. hot had a high modulus of shearing and a viscosity 100 times as great as that of water. Drawings of the instruments used, 9 graphs, several tables of data and the equations necessary for their use are given. F. E. BROWN

Velocity function of viscosity of disperse systems. V. Viscosity of colloidal solutions in the structural, laminar and turbulence regions. WO. OSTWALD AND R. AUERBACH. *Kolloid-Z.* **38,** 261–80(1926); cf. *C. A.* **19,** 2288–9.—The sigmoid curve which is obtained when the viscosity, v, of a colloidal soln. is plotted against the pressure, p (cf. *C. A.* **19,** 3045), shows 3 portions, named the structural, laminar and turbulence regions. In the structural region, the law $v = kp^n$ is obeyed, where n is a const. greater than 1, which may be as great as 7. The law of Hagen and Poiseuille is obeyed in the laminar region, the viscosity being independent of the pressure. By observations conducted in this region, values of the abs. viscosity of water in agreement with those given in the Landolt-Börnstein tables are obtained. In the turbulent region, the relation $v = k_1p^{1/n}$ holds, the value $n = 1.75$ suggested by Blasius being found to fit the results fairly well. The appearance of turbulence is marked by a const. "Reynold number" $R_K = v_K\rho r/\eta$, where v_K is the crit. velocity of turbulence, ρ and r are the density and radius of the viscosity tube, resp., and η is the abs. viscosity of the soln., R_K being independent of the dimensions of the tube and the viscosity of the liquid. Examples of the curves obtained are shown for colloidal solns. of gelatin, Hg sulfosalicylate, gum arabic, glycerol and starch. The anomalies found by Hatschek and Jane using ammonium oleate (above) are attributed by the authors to "structural turbulence," which is different from the normal turbulence effect. The observation that previous mech. treatment of the sol lowers the viscosity and also the crit. velocity of the turbulence effect is confirmed. B. C. A.

Kinetics of swelling and dehydration of gels. I. S. LIPATOV. *J. Russ. Phys.-Chem. Soc.,* Chem. Part, **57,** 55–64(1925).—As is known, the formula of Noyes and Whitney $K = (1/t) \ln [m/(m - Q)]$ is applicable to the swelling of gels; that it cannot be applied in some cases is due to secondary processes. Orlov modified this formula thus: $K = -(1/t) \ln [m/(m - \gamma Q)]$, γ being a const. expressing the speed of the secondary process. This equation applies for all known cases of swelling of gels. In order to verify these equations expts. were carried out by swelling pure gum (purified by dialysis and contg. only 0.19% ash) in pure water, and in water contg. electrolytes in soln. In order to dehydrate the gels they were kept in the presence of alc., where-

upon during the first min. the gels lost water very quickly, but the process gradually slowed down and the gels tended to reach an equil. with the surrounding atm. Two processes are involved: (1) speed of diffusion of water from the internal layers to external, and (2) speed of diffusion of water in the atm. immediately surrounding the gels. The slowing down of dehydration is not due to gradual diln. of alc., which is insignificant The equation expressing all known cases of dehydration of gels is $K = [1/(a - E)t] \ln [(a - \gamma Z)E/(E - \gamma Z)a]$, where a represents the initial water content in the gel, E the quantity of water which the gel is capable of giving off in the lapse of time $t = 0$ or ∞, and Z the quantity of water which the gel gives off in the time interval t. II. *Ibid* 439–49.—Thin plates of gel absorb water with greater speed than thick ones. The speed of swelling (*i. e.*, the quantity of water absorbed by 1 g. of gel in a unit of time) is inversely proportional to the thickness of the gel plate. If Δ is the thickness of the gel plate, the equation of swelling is: $K = (\Delta/t) \ln [m/(m - \gamma Q)]$. Swelling must be considered as the first stage of the process of soln.; it is an intermediate state in the passage from gel to sol. BERNARD NELSON

The cleavage of strongly stretched gelatin. J. R. KATZ AND O. GERNGROSS. *Kolloid-Z.* **39**, 180–1(1926).—Gelatin was stretched to 4 times its normal length. Dried in air, it tended to split in the direction of the stretching. Dried over H_2SO_4 in a vacuum, frequently it split open along the longer axis before it was disturbed. When struck by a hammer, a mass of parallel fibers formed. F. E. BROWN

The preparation of strongly stretched gelatin preparations and their x-ray diagrams. Gelatin and collagen. O. GERNGROSS AND J. R. KATZ. *Kolloid-Z.* **39**, 181–3(1926); cf. preceding abstr , and *C. A.* **19**, 528.—The x-ray spectrum of gelatin stretched 300% in 60% alc. and dried in air under tension was compared with the x-ray spectrum of collagen (the tendon of Achilles of an ox). There are many resemblances and few differences. This seems to be the first time that an apparently amorphous substance has been converted into a cryst substance by merely stretching it. Three photographs are reproduced. F. E. BROWN

The significance of the variation in the Smoluchowski coefficient (β). MAUDE GARNER. *J. Phys. Chem.* **30**, 1410–4(1926).—The Smoluchowski formula for coagulation at a rate so fast that increase in concn. of electrolyte will not hasten it is $\nu_1 = \nu_0/(1 + \beta_0 t)_2$, in which ν_0 and ν_1 are, resp., the initial concn of primary particles and the concn. of primary particles after t secs. have elapsed and β_0 is a function of the diffusion const. and radius of attraction of the primary particle. When the concn. the electrolyte is small enough so that rate of coagulation depends on concn. of electrolyte only a fraction of the encounters result in union. Let ξ be the probability factor to correct for this phenomenon, and let $\beta = \xi\beta_0$. $\beta = (1/t)[\sqrt{(\nu_0/\nu_1} - 1]$ and can be calcd. or obtained graphically by taking the tangent to the curve found by plotting $\sqrt{(\nu_0/\nu_1)} - 1$ against time When calcd the coeff falls rapidly for a short time (5 sec. to 22 min. for different sols), remains const. during the greater part of the coagulation and then falls again just before coagulation is complete This is explained by the assumption that a few primary particles carry less than the av. charge, the majority carry about the av. charge and a few others carry more than the av. charge. F. E. BROWN

The influence of dissolved electrolytes on the electric charge of a difficultly soluble powder as measured by endosmosis. K. HAYASKI. *Kolloid-Z.* **39**, 208–17(1926).—Only slight modifications were made in the app. and method previously described (cf. *C. A.* **17**, 2807; **19**, 3192). The electrokinetic potential in the sense used by Freundlich was calcd. by the equation of Helmholtz and Smoluchowski: $\zeta = 4\pi\eta\lambda V/iD$. 90,000 v., in which the viscosity (η) for H_2O or dil. solns. = 0.011; λ = sp. cond.; V = cc. H_2O transported per sec.; i = current in amps. and D the dielec. const. for H_2O = 81. The powders used were HgCl, $Cu_2Fe(CN)_6$, $Al(OH)_3$, $Th(OH)_4$, asbestos, talc and glass. Approx. 35 electrolytes were used, which included chlorides of univalent, bivalent and tervalent cations, K salts of univalent, bivalent and tervalent anions and several acids and bases. No generally applicable rule for the influence of electrolytes on the charge was found. The series in the order of valence was most evident with the silicates. H and OH ions occupied a special position in this series. Lyotrope series was found for HgCl, $Cu_2Fe(CN)_6$ and $Al(OH)_3$ with univalent cations. Series in the order of the soly. of the salts resulting from adsorption was evident only with anions. The H ions exerted a stronger positive and the OH ions a stronger negative influence than is indicated by the above rules. With amphoteric substances the sign of the charge was very much dependent on the concn. of the H ions. H. M. MCLAUGHLIN

The adsorption of ions with the same kind of charge as a stabilizing factor in the dilution of sols, and in their adaption and in the antagonistic action of electrolytes on the

coagulation of colloids. K. Ch. Sen. *Kolloid-Z.* **39**, 324–8(1926).—Some sols adsorb large amts. of ions of like charge. Such sols, contrary to the usual behavior of sols, require a greater concn. of electrolytes to cause pptn. after diln. than before diln. The valence of the ion of like charge has a great influence on the pptg. concn. of univalent ions of opposite charge. These sols with the same electrolytes exhibit antagonistic effects and the phenomenon of adaptation. Expts. carried out with positive sols of $Fe(OH)_3$, of $Al(OH)_3$, and of $Cr(OH)_3$ in the presence of $FeCl_3$, $Al(NO_3)$, $Fe(NO_3)_3$, HCl, HNO_3, etc. and with negatively charged sols of As_2S_3, Sb_2S_3, mastic, Prussian blue, $Cu_2Fe(CN)_6$, S, $Fe(OH)_3$, $Cr(OH)_3$, $Sn(OH)_4$, Au and oil-water and aniline-water emulsions with various precipitants illustrate these general principles. The order of pptg. value of K salts for negative sols, in the order largest concn. first, is $K_4Fe(CN)_6$, $K_3Fe(CN)_6$, tri-K citrate, $K_2C_2O_4$, K_2SO_4, KCl, KNO_3, KI, KBr. For positive sols chlorides have the following order: $FeCl_3$, $Al(NO_3)_3$, $BaCl_2$, KCl. These effects are due to the stabilizing effect of the adsorption of ions having the same kind of charge as the micelles. The higher the charge of the ion the more easily it is adsorbed. No new quant. data are given. F. E. Brown

The abnormal precipitation series. Hidema Mayanagi. *Kolloid-Z.* **39**, 319–22 (1926).—The p. d. between micelles may be lowered (*a*) by adsorption of oppositely charged ions and (*b*) by such a concn. of unadsorbed ions as decreases the thickness of the double layer. In the first case, the concn. of electrolyte necessary to ppt. the colloid is proportional to the concn. of colloid. In the second case the concn. of electrolyte necessary to cause pptn. is almost independent of the concn. of colloid. With a neg. colloid an abnormal pptn. series occurs when the electrolyte has a multivalent cation and a univalent anion. For instance when $FeCl_3$ is added to a neg. mastic sol, first the neg. charge is neutralized by adsorbed Fe^{+++} ions. If an excess of $FeCl_3$ is added, excess adsorption forms a pos. charged colloid very like a Fe sol. Since Cl ions do not neutralize an Fe sol, their effect will be only to change the double layer to such an extent that pptn. occurs a second time. The concn. required for this is independent of the concn. of the sol. Graphs and tables report investigations on such pptns. of mastic sol, of Au sol, and of egg albumin sol by means of $FeCl_3$; and of $Fe(OH)_3$ sol by means of $K_4Fe(CN)_6$, and confirm the general conclusions. F. E. Brown

The coagulating action of ions of equal valencies and the radii. Heat of adsorption of electrolytes. H. Lachs and Felix Lachman. *Z. physik. Chem.* **123**, 303–14 (1926).—Coagulation of hyophilic sols of Berlin blue and antimonic acid depends on the degree of hydration of the coagulating ion. Ions are adsorbed prior to coagulation and are partly dehydrated. The heat effect accompanying adsorption was studied for alkali and alk. earth ions on active charcoal. The degree of dehydration depends largely on the heat of hydration of the ion and diminishes for ions of the alkali metals from Li to Cs and for alk. earth metals from Mg to Ba, while the adsorptive power and coagulation action increase. The heat of adsorption may be considered to be a difference between the heat of adsorption in a vacuum and the heat of hydration. The first quantity is inversely related to the sum of the radii of the charged and discharged ions and the second contains the dielec. const. of the soln. and is inversely related to the radius of the discharged ion. The second quantity increases from Li^+ to Cs^+ and from Mg^{++} to Ba^{++}. The heat of adsorption in soln. grows in the above series. Equations and data are given to substantiate this view. R. W. Ryan

Colloidal systems in nitromethane. J. W. Williams and J. A. Skogstrom. *J. Phys. Chem.* **30**, 1170–4(1926).—The formation of colloidal systems of P_2O_5 in nitromethane with water as a peptizing agent is described. Org. acids, aldehydes, ketones and alcs. also peptize in like manner. The evidence seems to indicate a chem. reaction occurs between the P_2O_5 and peptizer. Raymond H. Lambert

The growth of small gold particles in the preparation of gold hydrosols from dilute alkaline gold solutions. Josef Zakowski. *Kolloidchem. Beihefte* **23**, 117–42(1926).—A study was made of the growth of the nucleus, its relation to temp. and to the Zsigmondy-Hückel formula. The growth of the Au particles follows in 2 periods: (1) slow growth—an induction period in which the above formula does not apply, and (2) very much more rapid growth, for which the formula is applicable. An increase in the surface of the nuclei, or of temp., or the application of ultra-violet light shortens the induction period. Old Au solns. do not give reproducible results as do fresh, well-boiled solns. Merrill Fenske

Dispersoid syntheses of gold. III. P. P. von Veimarn. *Kolloid-Z.* **39**, 166–72 (1926); cf. *C. A.* **18**, 491; **19**, 1977.—Colloidal Au was prepd. with glycerol as a dispersion medium, by pouring a weak soln. of $AuCl_3$ in glycerol into glycerol above 100° and cooling rapidly when the red color appeared. Gold sols formed in glycerol by the tartrate

and citrate methods were stable for a year without forming mold-like columns. Human saliva in very low concns forms colloidal Au sols. The variation in compn. of saliva is never enough to cause a change in color of the sol though the tone of red may vary somewhat. A little NaOH aids the dispersion. When such sols lose their water at room temp. they are reversible. On loss of water the residue forms concentric rings similar to *Liesegang rings* (cf. *C. A.* **18,** 2907). Other sols such as $Fe(OH)_3$ also form rings when the dispersion medium evaps at room temp. These rings are no less sharp than Liesegang rings due to chem. reactions in gels. F. E. Brown

The experimental formula for the electrolyte-swelling values of gold sols and ferric hydroxide sols. Kohei Hakozaki. *Kolloid-Z.* **39,** 316-9(1926); cf. *C. A.* **20,** 3114.—The formula $K = h\, i^{1.5}/(i_0^{1.5} - i^{1.5})$, in which i is the concn of electrolyte, h is the concn of the H-ion and i_0 is the max value of i, was tested by data secured from positive $Fe(OH)_3$ sol and negative Au sol. While the Na ion varied in concn. from 0.0105 to 0.21 and the p_H from 3.23 to 6.4 in a Au sol the exptl. points agreed with the theoretical curve for p_H plotted against concn of Na ion. Similarly the data for $Fe(OH)_3$ sols agree with the theoretical curve. F. E. Brown

General colloid chemistry. XXI. Stability and constitution of the Bredig silver sols. Wo. Pauli and F. Perlak. *Kolloid-Z.* **39,** 195-208(1926); cf. *C. A.* **19,** 2153; **20,** 1740, 2269, 2930.—After an extended series of preliminary expts these conditions were chosen for the prepn of Ag sols: a current of 3.6 amp for $^1/_2$ hr., Ag electrodes 1 mm in diam and 15 cm long and a vol of one l. Numerous trials in Jena and Ag vessels failed to produce stable Ag sols in freshly distd. cond H_2O. The stability of the Ag sols increased with the addn of KOH between the concn. limits of 10^{-5} N and 5×10^{-3} N. At the latter concn. of KOH the concn. of Ag rose to 45 mg. per l. In 10^{-2} N KOH rapid coagulation of the sol always occurred. In solns of AgOH stable sols were prepd only under the conditions given and at concns of AgOH approx 10^{-5} N. The highest concn of Ag obtained was 12 mg per l. As in the case of all noble-metal sols investigated continued dialysis failed to remove all the H ions, whose concn. gradually attained a practically const value. This process was evidenced by the cond curves in passing through a min and then rising to a final const value. On the basis of a colloid ion mobility of 20, the H-ion concn. calcd. from cond was about 30% higher than found by titration. This high value is explained by assuming that some K-ions have not been replaced by H ions. H. M. McLaughlin

The solution of silver micelles by hydrogen peroxide. The adsorptive binding or astochiometric compounds of sols and precipitates of silver. A. Fodor. *Kolloid-Z.* **39,** 173-8(1926).—Ag sols may be made from $AgNO_3$ by reduction with dextrin. They are negatively charged and dissolve immediately when H_2O_2 is added to them. When the sol is evapd the residue is extremely sensitive to light and changes from citron-yellow to dark gray or black. When Ag sols are prepd from $AgNO_3$ by means of Rochelle salt and $FeSO_4$ some particles are large and some small. After dialysis the small particles are positively charged, contain about 94.3% Ag and dissolve in H_2O_2 without the addn of acid. The larger particles are about 43.56% Ag and require the addn of acid as well as H_2O_2 to be dissolved. The sols are not absolutely pure, for traces of dextrin are found in them. These facts could be explained if the micelle is $[\mathrm{Ag} - \overset{-}{\mathrm{anion}}]\overset{+}{\mathrm{Na}}$ which, on continued dialysis, becomes $[\mathrm{Ag} - \overset{-}{\mathrm{OH}}]\overset{+}{\mathrm{H}}$ for the dextrin sol and the micelle from the Rochelle salt sol is $[\mathrm{Ag} - \overset{+}{\mathrm{H}}]\ \overset{-}{\mathrm{anion}}$. The anion must be extremely light to account for the immediate soln. of a micelle, which is nearly 95% Ag. The acid required for soln. could be adsorbed on a micelle of other substances accompanying the Ag micelle. F. E. Brown

A gel of metallic platinum. A. F. Benton. *J. Phys. Chem.* **30,** 1415-6(1926).—A fine ppt of metallic Pt was formed when Na_2PtCl_6 (27 g. of Pt per l. of soln.) was reduced by a 5% $NaCO_2H$ soln at the b. p. When the ppt was washed by decantation with boiling water in 600-700-cc. portions, the first 5 washings remained opaque indefinitely. The 2nd contained so much Pt that on standing for 2 days it became a gel. After standing in a covered beaker for 10 days, the gel contained 31% Pt by wt. (2.1% by vol.) and 0.048% NaCl. An attempt to duplicate the gel produced only a gelatinous ppt. F. E. Brown

The effect of anions upon the physical, chemical and colloidal properties of aluminum hydroxides. L. B. Miller. *Third Colloid Symposium Monograph* **1925,** 208-215; cf. *C. A.* **19,** 1465.—This research indicates that in water purification by alum 3 chem. factors det. the success: (1) a certain min amt. of Al ion; (2) an anion of strong coagulation power; (3) properly adjusted H-ion concn. Of all anions studied, SO_4

yields a "floc" with qualities best suited to water clarification, it being rapid-settling and compact. The p_H range over which $Al_2(SO_4)_3$ is thus effective (5.3–8.7, with a max. at 5.5) is much broader than that of $AlCl_3$ (7.8–8.6). "The ppt. which seps. when an Al salt in dil. soln. is treated with an alkali is not Al hydroxide (except perhaps at relatively high p_H values) but a more complex substance contg varying proportions of those anions present in soln." JEROME ALEXANDER

Organogels obtained from the benzoic acetal of sorbitol. PIERRE THOMAS AND (MLLE.) MARIE SIBI. *Compt. rend.* **183,** 282–4(1926).—The organogels prepd. by dissolving the benzoic acetal of sorbitol (I), in org. solvents are somewhat opalescent and anisotropic particles often show the phenomenon of extinction, indicating incipient crystn. A study of the diffusion of org. colors in the alcogel was made, all of the colors diffusing at the same rate. Treating I with boiling H_2O gives 2 fractions, a sol. hydrogel and an insol. part. D. H. POWERS

Colloid properties of complex mercury derivatives of sulfosalicylic acid. WO. OSTWALD AND M MERTENS. *Kolloidchem. Beihefte* **23,** 242–85(1926).—The effects of temp, time and stirring on the viscosity of gels formed by the mercuration of sulfosalicylic acid were studied Two types of gels were prepd and their viscosities compared under a variety of conditions. The α-gel contained some unmercurated sulfosalicylic acid, whereas the β-gel was freed of all excess acid. The course of the mercuration was followed by viscosity measurements and was found to proceed only slowly at room temp but quite rapidly at 55° to 60°. Vigorous stirring during mercuration tends to decrease the viscosity of the gel after about 24 hrs while the viscosity of unstirred gel continues to increase up to 72 hrs. The viscosity of α-gel increases only gradually with increase in concn of mercurosulfosalicylic acid up to a concn of 2% but much more rapidly at higher concn. Increase in temp. causes only a gradual decrease in the viscosity of α-gel whereas with β-gel the decrease is much more rapid. The influence of various salts on the viscosity of β-gel is reported The cations are arranged in series as follows: $K > NH_4 > Na > H$, K causing the greatest increase in viscosity while H has the least effect The anions studied are listed as follows; sulfate > citrate > oxalate > nitrate > chlorate R. C. NEWTON

The optical anisotropicity of colored sols of sodium mercurisulfosalicylate. SOPHIE BERKMAN AND H ZOCHER. *Kolloidchem Beihefte* **23,** 292–309(1926) —Sodium mercurisulfosalicylate sols, when colored with certain dyes, show dichroism. If methyl orange, Congo orange, acid eosin, ponceau or safranine are used the dichroism is negative, while if glacier blue, methylene blue, malachite green or benzogreen are used the dichroism is positive Rhodamine and crystal violet show positive dichroism in the red end of the spectrum and negative in the blue end. R. C. NEWTON

Absolute measurement of average size of droplets of the disperse phase of an emulsion. W P. DAVEY. *Science* **64,** 252–3(1926).—If a single drop of a permanent emulsion of the oil-in-water type is deposited on the surface of clean water without breaking the surface film it will spread on the water like an oil. If the surface layer is one particle deep the average diameter of the particle can be measured by Langmuir's method, which requires knowledge of the concn. of the emulsion, the total vol of the droplets as they exist in the emulsion and the area covered by the layer of single particles. G. L. WENDT

The size of pores in collodion membranes. D. I. HITCHCOCK. *J. Gen. Physiol.* **9,** 755–62(1926).—The pores in the collodion membranes used had pore radii of $0.3–2 \times 10^{-6}$ cm as detd from Poiseuille's law. The no. of pores per sq. cm. varies from 270×10^{10} to 7×10^{10}, decreasing with increase in pore size Microscopic examn. (dark-field illumination) indicates that the membranes consist of solid granules of collodion much less than 1×10^{-4} cm in thickness. C. H. R.

Ultrafiltration through collodion membranes. A. GROLLMAN. *J. Gen. Physiol.* **9,** 813–26(1926).—Collodion membranes have a sieve-like action which is affected by a variable layer of adsorbed fluid on the walls of the pores. Variation in pore size will persist even when membranes are made by the same technic. Collodion membranes will permit some filtration of colloidal particles of certain substances, and will partially retain some inorg. salts (NaCl and $CaCl_2$). It is unsound to make deductions concerning living tissues from demonstration of change produced in the behavior of collodion membranes. "Thus, the increase in the rate of filtration of water through collodion by diuretics or the change of permeability due to the presence of surface-active materials, gives us no information about their action in the living organism. The effect of these substances on a sieve-like membrane of the type of collodion would not necessarily bear any analogy to that exerted on the emulsion type of membrane of living cells.

The mechanisms of the reactions necessary to produce the same effects in such widely differing systems may be entirely unrelated." C. H. R.

Mechanism of ultrafiltration. J. DUCLAUX AND J ERRERA. *Kolloid-Z.* **38,** 54–7(1926).—See *C. A.* **19,** 1977. B. C. A.

Accurate characterization of protective colloids and allied substances. J. VOIGT. *Kolloid-Z.* **38,** 73–5(1926).—Expt. shows that certain protective colloids, possibly nearly all, decrease the no. of metal particles in hydrosols to an extent which increases with the coarseness of the protective colloid particles. If these are very finely divided, the effect may be reversed. By the addn. of certain electrolyte solns., the process can be made retrograde. At low concns. a protective colloid may act as a coagulant in certain circumstances. The detn. of the particle no. in a protective colloid soln. after the addn. of a stable formol Au sol. and of the alteration of this no. on addn. of electrolyte solns., together with the detn. of the Au no. and transition no., furnish a further trustworthy method of characterizing protective colloids. The method appears to be capable of useful application to body fluids. B. C. A.

Electrolytic concentration of protein solutions and hydrophile colloids. J. REITSTÖTTER AND G. LASCH. *Biochem. Z.* **165,** 90–5(1925).—By using a three-chambered cell, it is possible to achieve a ten-fold concn. of the colloid with the elimination of electrolytes. B. C. A.

Determination of the mobility of proteins. THE SVEDBERG AND ARNE TISELIUS. *J. Am. Chem. Soc.* **48,** 2272–8(1926).—It is proposed to study the mobility of proteins by the moving-boundary method, making the protein visible by photographing the cataphoresis tube in ultra-violet light of wave lengths below 300$\mu\mu$. In this preliminary study the mobility of electrodialyzed egg albumin, in a buffer mixture of AcOH and AcONa of different acidities, varied between 13.6×10^{-5} cm.^{2} sec.$^{-1}$ volt^{-1} toward the cathode at $p_H = 3.40$, and 7.9×10^{-5} cm.^{2} sec.$^{-1}$ volt^{-1} toward the anode at $p_H = 5.75$, all at $t = 13.5°$. The values show some departure from those found by Svedberg and Scott using fluorescence to make the protein visible. The absorption method is to be considered as more reliable. R. H. LOMBARD

Elasticity and flow double refraction in sols having non-spherical particles. I. H. FREUNDLICH, H. NEUKIRCHER AND H. ZOCHER. *Kolloid-Z.* **38,** 43–7(1926); cf. *C. A.* **20,** 1545.—In order to characterize the elastic behavior of sols, Newton's fundamental law of the friction of liquids must be used as a basis. The Couette viscometer is considered to be more suitable than the capillary type for the investigation of this question, since the measurement of the dependence of the friction on the velocity gradient is required. The possible relation between elastic behavior and the direction of flow double refraction in sols having nonspherical particles is discussed. **II.** *Ibid* 48–54.—For a series of sols having nonspherical particles (V_2O_5, benzopurpurin, and cotton yellow) the flow double refraction measured by the so-called "cross angle" has been compared with the viscosity and the flow elasticity. The last 2 quantities were measured by an app. similar to the Couette viscometer but reproducing as far as possible the conditions under which the cross angle was detd. The results of Stapelfeldt (*C. A.* **19,** 2435) with regard to the cross angle were essentially confirmed. The constancy of the cross angle with varying concns. found by Stapelfeldt with P_2O_5 sol proved, however, to be true only for small concns. At higher concns., it increases with the percentage of V_2O_5. The viscosity and flow elasticity of old V_2O_5 sols cannot be expressed by Szegvari's equation $W = \eta G + \theta$ (*C. A.* **18,** 1599), in which W is the resistance of the liquid, G the velocity of gradient, η the viscosity coeff., and θ the flow elasticity. θ is not const., but depends on G. Between the cross angle ψ (or the deformation ϕ deduced from this), on the one hand, and η and θ, on the other, no simple relation could be detected. With V_2O_5 sols there is some degree of parallelism between ψ and θ, but with the dyes a marked alteration in ψ with time is observed, while η and θ remain practically const. B. C. A.

The rapid and slow coagulation of polydispersed systems—gold and alumina dispersions. PAULI TUORILA. *Kolloidchem. Beihefte* 22, 191–344(1926).—A discussion of Smoluchowski's theory of rapid coagulation shows that for monodispersed systems (particles uniform in size), (1) the no. of particles per cc. decreases slowly if the no. at the start is small, but rapidly if the no. at the start is large; (2) if the no. at the start is very large it may be varied several fold without altering the no. of particles observed a certain short time after the beginning of coagulation; (3) after the lapse of a relatively long time from the start of coagulation the no. of particles is the same whether the no. at the start is large or small. A mathematical development by H. Müller is given for applying S.'s theory to the case of a polydispersed system contg. particles of two size

classes, one large and one small. Discussion of M.'s theory shows that, (1) after a short time from the beginning (30 sec.) the rapid coagulation of polydispersed systems differs very slightly from that of monodispersed systems if the initial no. of large particles is very great (10^{10}) or very small (10^7); (2) for intermediate initial nos. of large particles and medium or large initial no. of small particles the course of coagulation differs widely from that of a monodispersoid; (3) differences in the course of the coagulation in poly- as compared with monodispersoids are scarcely recognizable when the ratio of the diams. of the large to the small particles is 5:1 and become important only at a ratio of diameters of 20:1; (4) at a relatively long time after the beginning of coagulation the no. of particles is the same whether it is a mono- or a polydispersoid; (5) in a rapidly coagulating monodispersoid the diameter of the particles at any time remains so nearly uniform that the same probability factor for the collision of 2 particles can be used throughout the course of the coagulation. An exptl. study of the rapid coagulation of both mono- and polydispersed Au hydrosols confirmed the S. theory and its extension by M. in all of the foregoing particulars. The particle sizes in the different Au sols used varied from 2.9$\mu\mu$ to 97$\mu\mu$. A study of slow coagulation in Au sols showed that (1) in polydispersoids the small particles coagulate much more slowly than the large ones, possibly because of a slower reduction in the potential of the small particles; (2) in monodispersoids the coagulation follows S.'s theory except that after a relatively long time from the beginning the coagulation proceeds somewhat more slowly than the theory indicates. The coagulating power of cations for Au sols was found to increase in the order $Li^+ < Na^+ < K^+ < Rb^+ < Cs^+ < H^+$. When Au sol is prepd. by reduction of $AuCl_3$ in the presence of Cs_2CO_3 it coagulates more easily than similar sols prepd. by reduction in the presence of the other alkali carbonates. Expts. in the rapid coagulation of kaolin and Al_2O_3 sols confirmed S.'s theory for monodispersoids, but polydispersoids coagulated more rapidly than the M. theory indicates. Explanations of the discrepancy are offered. New exptl. technic is described for (1) counting particles directly in the observation cell of the slit ultramicroscope without interrupting the coagulation by the introduction of protecting colloid; (2) following the course of coagulation by means of the color change taking place, utilizing a wedge-arrangement after the principle of Bjerrum. F. L. BROWNE

Vapor pressure and base exchange of zeolites and permutites. V. ROTHMUND. *Z. Elektrochem.* **32,** 367–71(1926).—This is a discussion of the characteristics, properties and uses of zeolites, with special reference to water-holding and base exchange. These substances hold water in the same way as gels and not as hydrated salts, since the water mols. take no essential part in the crystal structure. The base exchange is expressed by $C_1V_2/C_2V_1 = \varphi[x/(n-x)]p$, where C_1 and C_2 are the concns. of the exchanging ions in the soln., V_1 and V_2 are the valences of these ions, and $\varphi[x/(n-x)]$ is a function of the ratio of one metal x to the other $(n-x)$ in the solid silicate; p is an empirically derived exponent which varies from 1.32 to 2.8 for different systems. C. E. P. J.

The carbon-dioxide content of distilled water and its determination. I. M. KOLTHOFF. *Chem. Weekblad* **23,** 381–4(1926).—For titration of CO_2 as a monobasic acid the endpoint is reached after complete conversion into HCO_3^-. The corresponding p_H for a very dil. $NaHCO_3$ soln. was calcd. to be 7.84 for 10^{-5} M, 7.95 for 2.10^{-5} M, 8.3 for 10^{-4} M. A further error in the detn., due to alkali-binding power of the indicator, has to be corrected by proper neutralization of the latter. K. uses phenol red dissolved 100 mg. in 4.5 cc. 0.1 N alkali and fills up to 100 cc. with water. One cc. of this soln. to 1 l. water will give a p_H of 8. For the CO_2 detn. 1 to 1 3 l. water in a Jena-glass flask, filled up to the top, 1 cc. indicator added, is titrated with 0.01 N Na_2CO_3 until the red-violet color remains for 5 min. Between each addition the flask is closed and shaken. For the CO_2 content of distd. water values up to 2.4×10^{-4} M were found, after air was passed through for 10 hrs. the value became 1.55×10^{-5} M (by simple standing it took a week to reach equil.), the theoretical value is 1.5×10^{-5} M. The method may be used for the detn. of CO_2 in air. B. J. C. VAN DER HOEVEN

Presence of air in pure and in alkaline water. J. PORTER. *J. Roy. Tech. Coll.* (Glasgow) **2,** 19–25(1925).—When pure water is heated to 100° it still retains about 11 cc. of air per l. and this is removed only by prolonged boiling. Addn. of 4 g. of NaOH per l. increases the rate of evolution of air at temps. above 60° and the air retained at 100° is only 4.8 cc. per l. The soly. of air in 4% NaOH soln. at 17° is 8 cc. per l., compared with 20.4 cc. in pure water. Very little air is evolved on heating water until a temp. above 80° is reached, and expts. are described which indicate that the air which is not evolved as it ought to be below 80° forms a layer of no appreciable vol. on the sides of the vessel and is not retained in supersatd. soln. If the water is maintained for a prolonged period at a temp. of 60°, however, all the excess air over the normal amt.

that will remain in soln. at that temp. is slowly liberated. Addn. of a slight amt. of oil to water during heating causes a more regular evolution of the dissolved air. B. C. A.

The science of adsorption. IV. Sorption phenomena and chemical processes. S. LIEPATOV. *Kolloid-Z.* **39**, 127–40(1926); cf. *C. A.* **19**, 2152, 3188; **20**, 2268.—Chemically pure substances were adsorbed on chemically pure colloids. The colloidal substances were alizarin-NO_2, MnO_2 and starch. The materials, HCl, H_2SO_4, AcOH, KCl, $Cu(AcO)_2$, $CuCl_2$, NaOH and $BaCl_2$, were dissolved in water or in some cases in alc. for adsorption. Moist MnO_2 is acid in reaction; starch and alizarin-NO_2 are not. MnO_2 adsorbs free bases and bases from org. or inorg. salts. The acids form compds. of definite compn. Alizarin-NO_2 adsorbs bases from salts with org. anions only. With bases it forms definite compds. Starch adsorbs alkalies only. Adsorption is purely chem. The amt. of adsorption is the result of a distribution of cations between the anions of the colloid and the anions in soln. or of anions between the cations of the colloid and the cations in soln. The laws of mass action hold but the active masses of colloidal particles are not const. The rate of adsorption depends on size of particle, temp. and diffusion. Gibb's theorem is not applicable. The equation $dc_2/dc_0 = K(M - Wc_2)$ is applicable, when c_0 is the original concn. of soln., c_2 the reduction of concn. due to adsorption, M the concn. which must be adsorbed to sat. the adsorbent, and K_1 and K_2 are consts. K_2c_2 may be either pos. or neg. F. E. BROWN

The adsorption of ions in comparison with their coagulating power. KSHITISH CHANDRA SEN. *Kolloid-Z.* **39**, 140–52(1926).—This investigation was carried out to det. whether elec. charge was or was not the only factor which dets the adsorption of ions on colloids. A review of the results of other workers leads to the conclusion that there is also a chem. affinity which sometimes almost entirely controls adsorption and consequent coagulation. Deviations from the Schulze-Hardy rule are to be ascribed to chem. adsorption. In spite of widely varying concn. of dissolved salts necessary to produce coagulation, in general, "the greater the adsorbing power of an ion the greater is its effect on endosmose, cataphoresis and coagulation of an oppositely charged sol." F. E. BROWN

Adsorption in its relation to catalysis and enzyme actions. J. DUCLAUX. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926**, 630–45.—In a general way mols. and atoms are conceived as existing either completely independently of one another or in chem. combinations which obey the ordinary laws of chem. mechanics. It is admitted that atoms or mols. which are brought in contact with one another give addn. compds This hypothesis has been verified in the only case in which it could be studied quant., *viz.*, with true gases. D extends it to all systems, liquid, gaseous and solid. These addn. compds are formed spontaneously, *i. e.*, either without activation, or, more probably, by autoactivation. Adsorption is but a particular case of the formation of these compds. D considers that these addn. compds. can undergo, either without activation or by autoactivation, an internal transposition which can in turn be followed by dissociation. Under these conditions, the function of the catalyzer consists essentially in allowing of a transposition which is equiv. to a reaction which, in its absence, would take place with difficulty and in low yield, or else at a higher temp. which might cause a decompn. either of the reacting compd. or of the newly formed compd. A. P.-C.

Adsorption. XV. Adsorption of ions by aluminum hydroxide and by a mixture of barium sulfate and aluminum hydroxide. M. R. MEHROTRA AND N. R. DHAR. *J. Phys. Chem.* **30**, 1185–93(1926); cf. *C. A.* **20**, 2437.—Mixts. of equiv. proportions of $BaSO_4$ and $Al(OH)_3$ were made by the reaction between $Ba(OH)_2$ and $Al_2(SO_4)_3$ solns. The ions, the adsorption of which was to be measured, were present in known concns. in the $Al_2(SO_4)_3$ soln. before mixing, and the resulting ion concn. was detd. after pptn. was complete. The decrease in anion concn. was attributed to adsorption of the anion by the ppt. in the course of its formation. The order of adsorption of the different anions by the ppt. was $Cr_2O_7^{--} > C_2O_4^{--} > IO_3^- > BrO_3^- > Cl^- > S_2O_3^{--} > NO_2^- > Fe(CN)_6^{III} > MnO_4^- > Fe(CN)_6^{IV} > CNS^-$. The adsorption of the same ions by $Al(OH)_3$ when pptd. from $Al_2(SO_4)_3$ and NaOH solns. was detd. in the same way. The order of adsorption was $C_2O_4^{--} > Cr_2O_7^{--} > Fe(CN)_6^{IV} > IO_3^- > BrO_3^- > S_2O_3^{--} > NO_2^- > Fe(CN)_6^{III} > CNS^- > MnO_4^- > Cl^-$. These and earlier measurements showed that adsorption by a mixt. of $BaSO_4$ and $Al(OH)_3$ is greater than the sum of the sep. adsorptions in the following cases. $Cr_2O_7^{--}$, IO_3^-, $Fe(CN)_6^{III}$, CNS^- and Cl^-; while it is less with MnO_4^-, BrO_3^-, $S_2O_3^{--}$, NO_2^- and $Fe(CN)_6^{IV}$. No definite conclusion with regard to the influence of one adsorbent on the adsorptive power of the other can be drawn. At any rate, no marked promoter action is noticeable due to the presence of one adsorbent along with the other. K ion was found to be adsorbed from solns. of $K_2C_2O_4$ and $KBrO_3$ by a mixt. of $BaSO_4$ and $Al(OH)_3$. R. L. DODGE

Adsorption from solution by ash-free adsorbent charcoals. II. Properties of purified adsorbent charcoals. E. J. MILLER. *J. Phys. Chem.* **30**, 1162–9(1926); cf. *C. A.* **19**, 1976.—Blood charcoal, a charcoal of animal origin, Norit, a charcoal of vegetable origin, and activated sugar charcoal were purified by a method previously described, until the ash content had been reduced to 0.05% or less. The adsorption of benzoic acid, strong inorg. acids, NaOH, methylene blue, ammonium eosin, KCl KNO_2 and K_2SO_4 by the charcoals was measured. The results are the same as with pure activated sugar charcoal (cf. earlier papers); benzoic acid was most strongly adsorbed, inorg. acids less and NaOH not at all. Adsorption of methylene blue, a basic dye, led to formation of acid in the soln.; ammonium eosin, an acid dye, left NH_4OH in the soln. From the solns. of the neutral inorg. salt only the acid arising from hydrolysis was adsorbed. The salt mols. as such were not adsorbed. The prevailing idea that charcoals adsorb acids and bases equally is erroneous. Activity tests (adsorption of benzoic acid) made before and after purification, showed that the fundamental nature or form of the charcoal was not changed by the purification process. A simple, convenient and reliable comparative test for charcoal activity based on benzoic acid adsorption is described in detail. There is also described a method for detg. the presence or absence of adsorbed acids and alk. inorg. matter in charcoals. R. L. DODGE

Adsorption of gases by charcoal. I. R. A. SMITH. *Proc. Roy. Soc.* (London) **112A**, 296–303(1926).—Some early work on the adsorption of O_2, N_2, H_2 and CO_2, a summary of which appeared in 1863, is now published in greater detail. H. S. VAN K.

The adsorption of ammonia by alumina, ferric oxide and chromic oxide. N. NIKITIN. *Z. anorg. allgem. Chem.* **155**, 358–60(1926).—Measurements of adsorption of NH_3 on the substances named in the title and of CO_2 on Al_2O_3 and Fe_2O_3, at pressures from 5 mm. to 1 atm. and at temps. between 15° and —20°. A. E. RUARK

Comparative study of adsorptive charcoals. P. HONIG. *Kolloidchem. Beihefte* **22**, 345–420(1926).—The charcoals employed were: (1) a blood charcoal carbonized after addn. of K_2CO_3; (2) a wood charcoal made by distn. of pine at 700°; (3) the pine charcoal activated with steam at a higher temp., giving a product similar to Norit; (4) Super-Norit, made by activating the pine charcoal with steam and the gases of combustion; (5) carboraffin, made by heating to 500° pine wood satd. with $ZnCl_2$. These products are shown by elementary analysis to contain besides C, more or less H and O in the form of compds. which play a part in adsorption. This is especially true of (5). The properties of these charcoals are not parallel, each having individual peculiarities. Their relative adsorptive powers vary with different adsorbents. In the adsorption of dyes, the presence of other substances such as acids and bases is very important. Prolonged activation with steam increases the C content, the sp. gr., and the adsorptive power. The heat of wetting increases in rough parallelism to the adsorptive power. The ease of attack by different chemicals varies widely and is not related to the adsorptive power. There is no direct connection between adsorptive power and catalytic influence. To define a charcoal clearly it is not sufficient to describe the raw material and the method of prepn., but in addn. the elementary analysis, sp. gr., adsorptive power and heat of wetting must be given. F. L. BROWNE

Further studies of the adsorption capacity of different preparations of charcoal. IWAO OGAWA. *Biochem. Z.* **172**, 249–61(1926); cf. *C. A.* **20**, 1009.—All highly activated prepns. of charcoal (from sugar, blood, naphthalene) adsorb acid from a neutral NaCl soln., leaving behind in the soln. NaOH. On the contrary, a NaCl soln. treated with the purified com. blood charcoal remains neutral. Sugar charcoal prepd. under moderate temp. adsorbs alkali from a NaCl soln. and leaves the original soln. acid. The elementary compn. of various charcoals (before and after activation by heat) was detd. with the following results: sugar charcoal, normal: C 95.2–95.3, H 0.7, O 4.0–4.1%; same activated: C 95.4–95.5, H 0.5, O 4.1%. Naphthalene charcoal, normal: C 90.9–90.7, H 1.3–1.4, O 7.8–7.9%; same activated: C 91.8, H 0.8, O 7.4%. Paraffin charcoal, normal: C 89.7–90, H 1.1–1.2, O 8.8–9.2%; same activated: C 90, H 1.1, O 8.9%. Crystallographic study of these different forms of C by means of Röntgen-ray analysis, while it has not yielded any definite results, at any rate established the fact that heat activation of the charcoals is not associated with a coarsening of the cryst. structure. S. MORGULIS

Adhesive forces in solutions. VIII. Solubility and adsorption of electrolytes. NIKOLAI SHILOV AND MARK CHEPELEVETZKII. *Z. physik. Chem.* **123**, 248–60(1926); cf. *C. A.* **14**, 1775; **16**, 2055; **20**, 1009.—The adsorption of alkali halides on active C appeared to be related to the m. p. of the salt except for Li. The salts of a series of metals were arranged according to their soly. From these tables a "normal series" of decreasing soly. was arranged. The anions for such a series were: I > Br > Cl >

$NO_3 > CrO_4 > SO_4 > PO_4 > CO_3 > F$. The cations of strongly positive metals increased the soly. of the lower members of the series, those of av. electropositive nature gave a normal series. The cations of the metals in the neighborhood of H in the e. m. f. series decreased the soly. of the upper members of the series—an effect which is intensified by the weakly positive cations. Soly. is influenced by dimension, structure, and valency of the ions as well as by the structure of the mol. Adsorption and coagulation series can well be compared with soly. data and analogous relations will appear. R. W. RYAN

The influence of solubilities of salts in water by addition of a non-electrolyte to the solution. JOHN MCAULAY, JR. *J. Phys. Chem.* **30,** 1202–8(1926).—Assuming that the effect produced by addn. of a non-electrolyte to a salt soln. is primarily due to the change in the dielec. const., McA. finds that consistent values for the ionic radius may be calcd. from the soly. of salts in acetone-water and alc.-water mixts., and the dielec. consts. of the mixts. In some cases it is necessary to consider the distribution of the 2 solvents around an ion, and even this does not eliminate the differences between the value of the ion radii calcd. for alc.-water and acetone-water mixts. B. H. CARROLL

Solubility of silver oxide [in mixtures of water and alcohol at 25°]. SIMON KLOSKY AND LEO WOO. *J. Phys. Chem.* **30,** 1179–80(1926).—A nephelometric method in which the percentage of alc. varied from 0 to 90 in approx. 10% intervals. The curve is similar to that for silver nitrate. RAYMOND H. LAMBERT

An empirical formula for the relation between viscosity of solution and volume of solute. M. KUNITZ. *J. Gen. Physiol.* **9,** 715–25(1926).—The empirical formula, $\eta = (1 + 0.5\varphi)/(1 - \varphi)^4$, in which η is the relative viscosity of the suspension (ratio of abs. viscosity of the suspension to that of the pure solvent) and φ the vol. occupied by the dispersed substance expressed as a fraction of the total vol. of the soln., closely represents the relation between vol. of solute and viscosity of the soln It holds good for concns. as high as 50% of sugars, glycogen, casein and rubber. C. H. R.

The viscosities and densities of anhydrous methanol and of solutions of some halides of sodium and potassium in this solvent. F. K. EWART AND H R. RAIKES *J. Chem. Soc.* **1926,** 1907–12.—The authors prepd. anhyd. MeOH, without the use of dehydrating agents, by means of repeated refractionation. The viscosity, measured by means of an Ostwald type of viscometer, was found to be $\eta_{25°} = 0.00545$; $d_{4°}^{25°} = 0.78641$. The effects of added H_2O and Me_2CO on the viscosity were measured. The ds. and viscosities of various solns. of KI, KBr, KCl, NaI and NaBr in this solvent 0.02840–0.6142 g.-mol./1000 g. soln. were detd. together with the viscosity increment $[(\eta_{soln.} - \eta_{alc})/\eta_{alc}.C]$; C = concn. The vol. change on soln. for all the solns , except those of NaI which showed considerable discrepancies, were calcd. by the method of Hartley and Barrett. E. R. SCHIERZ

The viscosity of univalent salts of the higher fatty acids in water solution. K. S. MALIK. *Kolloid-Z.* **39,** 322–4(1926).—There are 3 important equations which relate concn. and viscosity, A. Einstein's, $\eta = \eta_0(1 + K\phi)$, in which $K = 2.5$; Hatschek's the same except $K = 4.5$; S. Arrhenius's $\log \eta/\eta_0 = \theta c$, in which θ is a const. and c is the concn. of the solute. The observed and calcd. values for η for Na stearate for concns. 0.0125–0.0765 g. per cc. and Na palmitate for concns 0.0115–0.0695 g. per cc. at 60°, at 70° and at 80° are compared. The values calcd. from Einstein's formula are much lower than those observed. The equation of Arrhenius seemed applicable but the value of the const. was far from that given by Arrhenius and the const. is affected somewhat by changes of concn. or temp. F. E. BROWN

Viscosity (and density) measurements of solutions of ethyl alcohol and methanol. HEINRICH GOLDSCHMIDT AND HARALD AARFLOT. *Z. physik. Chem.* **122,** 371–82(1926).—By means of an Ostwald-Sprengel pycnometer to det. ds , and an Ostwald viscometer, the following mixts. have been studied: C_2H_5OH and CH_3OH as solvents with the following solutes: H_2O, HCl, HCl + H_2O, HBr, HBr + H_2O, picric acid + H_2O, NaI, NaI + H_2O, CH_3OH, $C_6H_5NH_2$, *p*-toluidine, piperidine. Seven org. acids of 0.1 *N* concn. in abs. MeOH and EtOH have been studied as solvents for *p*-toluidine, aniline and piperidine as solutes. J. H. PERRY

Aqueous solutions of sodium silicates. IV. Hydrolysis. R. W. HARMAN. *J. Phys. Chem.* **30,** 1100–11(1926); cf. *C. A.* **20,** 3372.—The concns. of OH ion and % hydrolysis of silicate solns. of ratios $Na_2O:SiO_2$, 2:1, 1:1, 1:1.5, 1:2, 1:3, 1.4, and at concns. 0.2–0.01 *N* have been detd. by the H_2 electrode method. At 0.01 *N* Na_2SiO_3 is 27.8% hydrolyzed, and ratios 1:3 and 1:4 at same concns. show 1.5% hydrolysis. Probably much of the silica is present as complex silicate ions and ionic micelles. The liquid–liquid p. ds. between the silicate solns. of concn. 0.01–2 *N*, and KCl have been

detd. by the Bjerrum extrapolation method. With ratio 2:1 and 2 N the p. d. = —0.0039 v. and with a ratio 1:4 and 2 N the p. d. = +0.0050 v. MERRILL FENSKE

The solubility and electrolytic conductance of mesitylenephosphinous acid. H. J. M. CREIGHTON. *J. Phys. Chem.* **30**, 1209–10(1926).—The soly. in water, in g. per 100 g. soln. is, for 1°, 0.289; 25°, 0.299; 35°, 0.324; 45°, 0.385; 65°, 0.525; 85°, 0.700. Cond. of the Na salt was detd. at 25°; λ_∞ of the acid anion is 28.9. B. H. C.

Solubility in binary liquid mixture. THEO. DISSELKAMP. *Z. physik. Chem.* **123**, 99–110(1926).—To prove the basis of the Dolezalek theory of binary mixts. the soly. of anthracene was measured in a large no. of binary mixts. at different temps. This theory states that if the vapor pressure is greater than that calcd., dissocn. occurs; and if less than that calcd. compd. formation is the reason. A relation was not found between surface tension and soly. as Skirrow and Christoff (*Z. physik. Chem.* **41**, 139 (1902)) obtained from the soly. of gases in liquid mixts. The soly. curve of anthracene in binary normal liquid mixts. is analogous to its vapor-pressure curve. In mixts. of normal liquids at the same temp. the soly. change is proportional to the vapor-pressure change. In mixts. of anomalous liquids (alcs., acids) the soly. curve deviates considerably from the vapor-pressure curve, the circumstances being perplexing so that the test of the Dolezalek theory cannot be made. MERRILL FENSKE

The freezing-point lowering at infinite dilution. MERLE RANDALL. *J. Am. Chem. Soc.* **48**, 2512–4(1926).—When the j-function of Lewis and Randall (cf. *C. A.* **15**, 2374) divided by the square root of the molality ($m^{1/2}$) is plotted against $m^{1/2}$, the curve drawn for freezing-point data extrapolates to a limit, characteristic of each type of salts. The curve may be used as a criterion of the accuracy of data for very dil. solns. The equation $\log \gamma = -Awm^{1/2}$ of Debye and Hückel was combined with the equation

$$\log \gamma = -(j/2.303) - (2/2.303) \int_0^{m} (j/m)^{1/2}\, dm^{1/2}.$$

From this combination the values of the function ($j/m^{1/2}$) in the limit $m = 0$ were calcd. for various types of salts at 0° and at 25°. These values are, resp., for uni-uni, 0.375 and 0.394; for uni-bi, 1.300 and 1.365; for uni-tri, 2.760 and 2.895; for bi-bi, 3.00 and 3.15; for bi-tri, 8.73 and 9.14. F. E. BROWN

The activity coefficient of electrolytes from the vapor pressure of the solvent. MERLE RANDALL AND A. MCLAREN WHITE. *J. Am. Chem. Soc.* **48**, 2514–7(1926).—The divergence function h of Lewis and Randall is altered so that it may be applied to solns. of electroytes as well as solns. of nonelectrolytes, by assuming that the formation of ν parts of a mol. multiplies the rate of decrease of the activity of the solvent by ν. At 0° the h and j functions should be identical in the limit. The graph of $h/m^{1/2}$ and $j/m^{1/2}$ against $m^{1/2}$ shows $h/m^{1/2}$ below $j/m^{1/2}$ at higher concns. and above at very low concns. The activity coeff. of KCl at 20° as calcd. by this method varies from 0 772 at 0.1 M to 0.570 at 2.0 M. F. E. BROWN

The activity coefficient of soap solutions. MERLE RANDALL, J. W. MCBAIN AND A McL. WHITE. *J. Am. Chem. Soc.* **48**, 2517–22(1926); cf. the 2 preceding abstracts. —The activities of 8 K soaps were calcd. from vapor pressure and f. p. data. When $h/m^{1/2}$ at 90° is plotted against $m^{1/2}$ an S-shaped curve results. A max. or inflection occurs where $m^{1/2}$ is about 0.6 and a min. between $m^{1/2} = 0.2$ and $m^{1/2} = 0.45$. The shorter-chain soaps have no max. but when the chain contains 10 or more C atoms the max. is very noticeable. These curves are explainable on the basis of hydration and formation of micelles. The max. for $h/m^{1/2}$ appears at the concns. where micelles have been assumed to form. For K laurate, $j/m^{1/2}$ is plotted against $m^{1/2}$. This curve for f.-p. data shows a much more marked max. and at lower concns., which is exactly what the micelle theory would predict. The activities of the 8 K soaps, acetate, hexoate, octoate, decoate, laurate myristate, palmitate and stearate and 7 Na soaps, acetate, octoate, laurate, myristate, palmitate, stearate, and behenate were calcd. for 90° and the activities of K decoate, laurate, and oleate were calcd. for 0°. The concns. included are from 0 01 to 1.0 M. At 1.5 molar concns. 2 phases appear and the vapor pressures are anomalous for solns. of soaps from the laurate to the behenate; so activity calcns. were not possible. F. E. BROWN

Interaction of ions. E. GÜNTELBERG. *Z. physik. Chem.* **123**, 199–247(1926).—Electrometric detns. of activity coeffs. of HCl at 20° from 0.01 to 1.0 N give a min. of 0.76 at 0.35 N, and agree well with those calcd. by Hückel's equation, $\log f = -0.5\sqrt{c}/(1 + 1.4\sqrt{c}) + 0.136c - \log (1 + 0.036m)$, which, however, is no proof of the correctness of the theory. The activity of HCl in mixts. with alkali chlorides in 0.1 N total Cl^- concn. is for HCl alone 0,799; extrapolated to 0 HCl, for LiCl 0,7977, NaCl

0.7913, KCl 0.7837, CsCl 0.7726. The lack of constancy disproves the MacInnes-Harned-Lewis theory that the activity of an ion depends only upon its nature and total concn. Brönsted had proposed either a linear relation between log. of activity coeff. and osmotic coeff. or "specific interaction" of the ions. These 2 would have the same effect when there is a common ion, but Brönsted's soly. detns. show that when there is no common ion, the variation of the osmotic coeff. is not linear but probably parabolic. The theory of specific interaction is discussed in the light of the theory of "complete dissociation" and the Debye-Huckel calcns. Exception is taken to Hückel's latest work (*C. A.* **19,** 1649) about the relation between activity coeff. and dielec. const., especially since the fundamental idea seems inconsistent with the theory of sp. interaction. A. W. FRANCIS

The degree of dissociation of lithium chloride and sodium bromide in absolute ethyl alcohol. C. DRUCKER AND R. SCHINGNITZ. *Z. physik. Chem.* **122,** 149–69(1926).—The e. m. fs. of the cells made up from solns. of LiCl and NaBr in abs. C_2H_5OH: Ag | AgCl, $LiCl_{I}$ | $LiCl_{II}$, AgCl | Ag; Li_xHg | LiCl, AgCl | Ag; Ag | AgBr, $NaBr_{I}$ | $NaBr_{II}$, AgBr | Ag; Na_xHg | NaBr, AgBr | Ag have been measured as well as the elevations of the b. ps. and the transference nos. of the ions at 35°. The limiting values of the mobilities of the ions at 25° are: $\mu_H = 63.4$; $\mu_{Li} = 15$; $\mu_{Na} = 24$; $C_{Cl} = 21$, $V_{Br} = 20$. From measurements of the e. m. f. of the cell Ag | $AgNO_3$, $NaClO_4$ | $NaClO_4$, AgCl | Ag, the soly. product of AgCl in alc. has been calcd. to be 4.10^{-18}. The substitution of this value in the formula for the calcn. of the e. m. f. of the double cell: Li | LiCl, AgCl | Ag | AgCl, LiCl | Li+, shows large divergences from the measured values. The same is also true
(in H_2O) in C_2H_5OH
for the analogous cells with H_2 | HCl in place of Li | LiCl. It is, therefore, concluded that there is greater solvation in the C_2H_5OH than there is in the H_2O. The degree of dissocn. of the salts LiCl and NaBr from measurements on the raising of the b. ps. and e. m. fs. of the cells are not in very good agreement. J. H. PERRY

The theory of electrolytic ions. XXXII. The determination of the conductivities at infinite dilution of the ions of KCl, LiCl, NaCl, NaBr and KI. RICHARD LORENZ AND J. WESTENBERGER. *Z. anorg. allgem. Chem.* **155,** 144–59(1926). **XXXIII. The transport numbers of the anions of NaCl, KI, KBr and of KCl and LiCl.** *Ibid* 273–80; cf. *C. A.* **20,** 3119.—In the first paper, using the consts. *A* (Herz) and *B* (Lorenz and Ostwald) the authors are able to calc. accurate values of the conductivities of the salts at infinite diln. and hence the ionic mobilities at infinite diln. From these results the values of μ, the mol. cond. and u and v, the ionic mobilities, are calcd. for the above salts at all dilns. and are given in a table. The results are expressed in such a form that when u and v are added for equal concns. the mol. cond. of the salt is obtained. In the second paper the transport numbers $(1 - n)$ of the anions of the salts mentioned are calcd. from μ, u and v $(1 - n) = v/\mu$. If the transport numbers are plotted against the cube root of the concn. the curve is linear only in the special cases of LiCl and KCl. In general the points lie on the branch of an hyperbola. R. E. GIBSON

The electrolytic potential of iron amalgam. J. HEYROVSKY AND B. SOUCEK. *Compt. rend.* **183,** 125–7(1926).—When compared with metals which form amalgams directly Fe is found exceptional in being more strongly electropositive than its amalgam. In a normal soln. the difference is 0.400 v. The free energy of metallic Fe is 9220 cal. less than that of its amalgam. Fe amalgam is metastable. Direct amalgamation of Fe is impossible. Fe amalgam was prepared by electrolysis of $FeCl_3$ or $Fe_2(SO_4)_3$. Concn. of H ion does not influence potential of metastable amalgam or iron deposit. A theory of the magnetic moments of the iron atoms is given to explain the phenomenon. L. D. ROBERTS

The velocity of solution of aluminum. M. TZENTNERSHVER AND W. ZABLOCKI. *Z. physik. Chem.* **122,** 455–81(1926).—Metallic Al is covered with a passive surface layer which grades off continuously into the active "metal core." The thickness of this passive layer is not of mol. dimensions but varies between 30 and 84 microns, depending upon the previous treatment of the surface. With an increase of the concn. of HCl, the thickness of the passive layer remains unchanged, although the velocity const. increases rapidly. In agreement with the idea developed by Hantsch, the reaction does not take place between H ions but rather between the undissocd. mols. of acid and the A latoms. The velocity of this reaction is decisive for the course of the whole soln. process. From expts. at 25° on the velocity of soln. of Al (0.24% Si and 0.45% Fe) in HCl of solns. of concns. varying from 0.5 to 4.0 *N*, HBr, HI and H_2SO_4 and combinations of these acids, the following facts have been deduced: (1) The velocity of soln. of Al is very slightly dependent upon the velocity with which the liquid is stirred. (2)

The temp. coeff. of this soln. velocity is from 1.7 to 2.4 for a temp. rise of 10°, which is the order of magnitude of the temp. coeff. of true homogeneous chem. reactions. (3) The soln. velocity of Al does not depend upon the degree of dissociation of the acid, but is detd. by the relationship of the Al to the union of the acid. Addn. of $AlCl_3$ to the HCl greatly increases the soln. velocity of the Al on account of the repression of the dissocn. of the HCl. The addn. of sulfates and nitrates causes the soln. velocity of Al in HCl to be decreased, which is assumed to be a result of the decrease of the free, undissocd. HCl in the soln. The soln. of Al in alkali is purely an ionic reaction, which is expressed by the equation $Al + OH^- + H_2O \rightleftarrows AlO_2^- + 3H$. J. H. P.

The position of tungsten and molybdenum in the normal potential series. A. S. Russell and S. W. Rowell. *J. Chem. Soc.* **1926**, 1881–92.—When acid solns. of W and Mo salts are shaken with amalgams of various metals the greater part of the ions is reduced to the tervalent state of oxidation and a small part is reduced to the metallic state and may be identified by its *catalytic action on the reaction* $2H \longrightarrow H_2$. This serves as a delicate reaction for identifying W in soln. The catalytic effect on this reaction of W, Mo and Pt is greater than that of Pd, Cr, Mn, Co or Fe. By finding the most noble metal which can displace W and Mo from soln., and the order relative to metals of known normal potential, in which they are removed from Hg by oxidation with $KMnO_4$, the position of W and Mo in the normal potential series is found to be approx. that of Hg. Preliminary work shows that Cr, Mn, Fe, Co, Cu, Mo and W are slightly sol. in Hg. Merrill Fenske

A study of the reactions involved in displacement of metals, with a special method. Jean Barlot. *Ann. chim.* **6**, 87–134(1926).—The formation of Cu dendrites is studied with metallic Zn on filter paper supported by glass and moistened with Cu salt. Lines of dendrites were formed, especially at corners and edges. Related phenomena are observed with other metals and salts. The contact liquid-metal gives rise to an elec. field which dets. the direction of lines of dendrites. Electrons follow the dendrite path. When the glass support of the filter paper was replaced by a conducting surface no dendrites were noted but metallic striae or rings appeared, possibly related to the Liesegang ring phenomenon. Striae are more widely sepd. for salts of strong acids and closer for salts of weak acids. The formation of such rings may be due to inequal velocity of pptn. of Cu and soln. of Zn. Rings are closer together when forces that tend to oppose escape of electrons are greater. In the general case striae may be due to inequal velocity of diffusion of ions. Roger W. Ryan

The precipitation of metals in non-aqueous solutions. I. Robert Müller, Alfons Schimke and N M. Farmakides. *Z. anorg. allgem. Chem.* **155**, 333–47(1926).—Expts. at 18–77° and 100° have been carried out to det. the amts. of Ni and Zn in soln. and the amts. of Ni and Zn metals, Ni hydroxide and at. Ni in the solid, at equil., starting with solns. of varying ratios of Zn and Ni in a 98% alc. soln. and in contact with a solid phase of variable ratios of Zn and Ni. A concise abstr. of the data is not possible. J. H. P.

The action of metals on nitric acid. E. J. Joss. *J. Phys. Chem.* **30**, 1222–75 (1926).—The action of metals on HNO_3 is a special case of the electrolytic theory of corrosion. Factors governing the products obtained are: H overvoltage, catalytic action of the metal and metallic nitrate on the various reduction products and products reacting among themselves. The real depolarizer in the action of metals on HNO_3 is probably nitrosic acid ($H_2N_2O_5$). A schematic representation of the reduction products of HNO_3 is presented. Bibliography. Raymond H. Lambert

The influence of ionic charge on the osmotic behavior of alcoholic solutions. O. E. Frivold. *J. Phys. Chem.* **30**, 1153–61(1926).—Extension of previous ebullioscopic measurements (*C. A.* **18**, 2453) on alc. solns. of salts, to include $CoCl_2$ and $La(NO_3)_3$ in MeOH and EtOH. The detns. are mostly for concns. giving considerable deviations from the values calcd. by the Debye-Hückel theory, but in all cases the curves appear to approach the calcd. line at the lower concns. B. H. Carroll

Studies of the electrical phenomena and ionic permeability of membranes. VIII. Permeability of dried collodion membranes for nonelectrolytes. Akiji Fujita. *Biochem. Z.* **170**, 18–29(1926); cf. *C. A.* **20**, 1940.—As a result of the study of the permeability of dried collodion membranes to nonelectrolytes the following rule was found to apply just as in the case of univalent cations: when the substances are arranged in the order of their diffusion coeffs. they form a series similar to that for free diffusion, but the differences along the series are even much more pronounced. Substances whose coeff. of free diffusion is less than 1/2 that of KCl, no longer diffuse through the dry collodion membranes (*e. g.* glucose, fructose, mannitol and sucrose). Ammonia, unlike the NH_4 ion, shows an extremely large diffusion capacity through the dry membrane.

The permeability for H_2O can be proven in a qual. way, but no method is yet available to det. this quantitatively. S. MORGULIS

The Soret effect. JOHN CHIPMAN. *J. Am. Chem. Soc.* **48**, 2577–89(1926).—The upper and lower ends of a cylindrical cell were kept in thermostats at 30° and 20°, resp., each end being fitted with a pair of electrodes, and the difference in concn. in the 2 ends due to the Soret effect was detd. by cond. measurements. Dil. solns. of 5 acids, 5 bases, 22 salts and 2 non-electrolytes were studied. The Soret coeff. was found to vary considerably for different substances and is regarded as an empirical quantity. The results are tabulated. E. R. SMITH

Electrical conductivity of liquid cyanogen bromide. GEO. GLOCKLER. *Proc. Nat. Acad. Sci.* **12**, 522–3(1926).—G. found the cond. of liquid cyanogen bromide at 55° to be about 0.02 mhos per cc. The products of the reaction were a colorless gas at the neg. pole and eventually a red deposit and some gas at the pos. pole. Products were not analyzed. The CN′ group may be considered to be a "pseudo atom." Other "pseudo atoms" are given. G. G. SWARD

The dissociation constants of weak acids and bases from solubility measurements. N. R. DHAR. *Z. anorg. allgem. Chem.* **153**, 323–31(1926).—The solubilities of boric and arsenic acids in solns. of the Na salts of org. acids were detd. at 22°. Both acids are more sol. in the solns. of the salts than in pure H_2O. From this increase in soly. the dissocn. consts. of the org. acids are calcd. with moderate consistency. R. E. G.

Direct reading of p_H by a compensation process using a standard wire. A. KANITZ. *Biochem Z.* **167**, 474–8(1926).—By using a standard resistance wire calibrated in milliv. (58.1 milliv. = 1 p_H) per mm. at 20°, and by having the H electrode so compensated that a sliding contact on the wire will balance it *vs.* the calomel cell, one can read p_H values directly from a scale under the wire. W. D. L.

The color change of Congo red in acidified acetone-water solutions. F. M. CRAY. *J. Phys. Chem.* **30**, 1276–82(1926).—The time for the change from red to blue was studied as a function of the compn. of the mixts., the H-ion concn. as detd. by cond., and the Congo red concn. The rate of change shows a minimum at approx. 65% acetone, and increases with increasing concn. of H ion and Congo red. The results are considered to favor the theory that the color change is due to change in colloidal state. B. H. C.

The question of the validity of Beer's law in dilute electrolytic solutions. H. v. HALBAN AND J. EISENBRAND. *Z. physik. Chem.* **122**, 337–48(1926).—The measurements of Suhrmann and Huppert (*C. A.* **19**, 3059) on aq. solns. of KNO_3 and alc. solns of salicylic acid are discussed critically and repeated experimentally. The large deviations from Beer's law found by Suhrmann and Huppert are shown to be due to exptl. errors and the previous results of Halban and Ebert (*C. A.* **19**, 1536) in agreement with Beer's law are confirmed. E. R. SMITH

The theory of the dielectric polarization in salt solutions. LUDWIG EBERT. *Proc. Acad. Sci. Amsterdam* **29**, 454–61(1926).—An attempt has been made to det. the no. of H_2O mols. which disappear in consequence of the interaction between ions and H_2O dipoles in salt solns. PER K. FRÖLICH

An explanation of dielectric polarization of water solutions. LUDWIG EBERT. *Z. physik. Chem.* **122**, 28–38(1926); cf. *C. A.* **19**, 2162.—The Lorenz-Lorentz equation for mixts. is supported by data using an equation relating sp. polarization to the dielec. const. The values are such, however, that the equation becomes very insensitive for H_2O and aq. solutions. For solns. of non-electrolytes no safe conclusions can be drawn as to the relation between amt. of orientation polarization and the change of the dielec. const. with dissolution of a material. A noticeable dipole must exist with cane-sugar solns. and in very dil. solns. abnormally large moments appear. R. H. L.

Absorption of gases in milk of lime. I. H. C. WEBER AND K. T. NILSSON. *Ind. Eng. Chem.* **18**, 1070–5(1926).—An app. for detg. the conditions governing the absorption of gases in milk of lime solns. is described. The results obtained by absorbing nearly pure CO_2 in various lime solns. under const. temp. are shown and discussed. They verify the multiple-film theory of absorption. Dry CaO and $Ca(OH)_2$ absorb a negligible amt. of CO_2 under the conditions existing. W. H. BOYNTON

The mechanism of chemical transformation. T. M. LOWRY. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926**, 135–78.—Starting from the fundamental postulate that "in org. as well as in inorg. chemistry reactions take place between ions, either free or bound," though these ions do not necessarily possess an independent existence as in the case of ions of electrolytes in soln. and may exist merely for a very short period before being converted into neutral mols., L. discusses from this standpoint some rather obscure points of org. chemistry which cannot be explained simply by means of Kekule's

non-polar bonds. He deals in turn with hydrolysis, esterification, isomerization and optical inversion. *Ibid* 179–98.—Discussion by M. T. Lowry, Armstrong, F. Swarts, A. Job, H. E. Armstrong, A. Berthoud, W. B. Hardy, Ch. Mauguin, Bragg, Sir Wm. Pope and J. Boeseken. A. PAPINEAU-COUTURE

The speed of the gas reaction $2NO + Cl_2 = 2NOCl$ in a magnetic field. F. A. HENGLEIN. *Z. Elektrochem.* **32,** 213–5(1926).—It was supposed that if part of the mechanism of the reaction $2NO + Cl_2 = 2NOCl$ involved sepn. of electrons, its speed might be influenced by a magnetic field. Expts. with fields of 20,000 gausses showed no variation in rate. F. R. B.

Velocities of reactions involving atoms. MAX BODENSTEIN. *Sitzb. preuss Akad. Wiss.* **1926,** No. 13, 104–14.—Although only a small fraction of the colliding mols. in a metathetical reaction react on each collision, reactions of free or dissocd. atoms occur at nearly every collision. In the case of $Br + Br = Br_2$, detd. as a step in the 6-membered chain reaction $H_2 + Br_2 = 2HBr$, reaction occurs once in every 800 collisions, but the reactions $Cl + Cl_2 = Cl_3$ and $Cl_3 + CO = COCl_2 + Cl$, both steps in a similar chain, give practical equivalence between collisions and reaction. G. L. WENDT

The co-action of molecules in trimolecular reactions. H. J. PRINS. *Chem. Weekblad* **23,** 389–93(1926)—P. characterizes as coaction the interaction in a certain type of trimolecular reactions, in which all 3 mols. react simultaneously. The combination of A and B reacts with C before it has returned from the intermediary activated state A'B' to an inactive compd. AB. In org. reactions two of the components may belong to one mol. (cf. Prins, *C. A.* **8,** 2695; **9,** 3159). Examples of coaction are the reaction of some metals with acid only taking place in the presence of nitrobenzene (*C. A.* **20,** 744, 1016), the action of two mols. formic acid on heavy metal nitrates or chlorates, etc. A further probable example discussed *in extenso* is the rapid reaction of Br in water or salt soln. on unsatd. compds. B. J. C. VAN DER HOEVEN

Revision of the kinetics of the iodic-hydriodic reaction. E. ABEL AND F. STADLER. *Z. physik Chem* **122,** 49–80(1926)—Since many inequalities appear in the data on calcg. the kinetics of the so-called Dushman reaction between HIO_3 and HI, a revision seemed necessary. In one case the soln. is satd. with I and in a second case the I is continually removed by extraction with benzene A purely pentamol. reaction takes place. Studies were made in H_2SO_4, HI and in an AcOH-acetate buffer soln. The Debye electrolytic theory is used to obtain the rate of change of iodate concn. with time. R. H. L.

The velocity of hydrolysis of the simplest formals. ANTON SKRABAL AND H. H. EGER. *Z. physik Chem.* **122,** 349–56(1926).—The velocities of the acid hydrolysis of the formals of Me, Et, Pr, iso-Pr, Bu, iso-Bu and sec.-Bu alcs. in aq. soln. have been measured at 25°. The velocity consts. are resp.: 0.00153; 0.0130; 0.0144; 0.0723; 0.0143; 0.0199; 0.0992 J. H. PERRY

The velocity of hydrolysis of acid anhydrides in aqueous solutions of electrolytes and non-electrolytes. ROSE SZABÓ. *Z. physik. Chem.* **122,** 405–13(1926).—The velocities of the hydrolysis of acetic and succinic acid anhydrides have been measured by an optical method, which depends upon the measurement of changes in the refractive index, which in turn are followed with an interferometer. The reaction velocity has been measured in isosmotic solns of salts, acids and non-electrolytes. In salt solns. the relation $K\eta$ = const. is approx. valid, where K is the velocity coeff., and η is the viscosity. H and acetate ions catalyze the reaction with acetic anhydride, while H and succinate ions are catalysts with succinic anhydride. The catalysis by H ions is small and the relation $K\eta$ = const. in acid solns. has not been studied. The effect of non-electrolytes upon these reactions is specific. J. H. PERRY

The velocity of hydrolysis of mixed acyl acetals. ANTON SKRABAL AND IWAN SAWIUK. *Z. physik. Chem.* **122,** 357–70(1926).—The acid and alk. velocity of sapon. of the acetate and propionate of ethylidene glycol ($CH_3CH(OH)_2$) have been measured. The following rule holds for the mixed acyl acetal as well as for the mixed alkyl acetal: the velocity const. of the mixed acetal is equal to the arithmetic mean of the consts. of both pure acetals. This rule is connected with the fundamental law of acetal hydrolysis: $X = k_0\,qp$, where X denotes the group const., k_0, a universal const., q and p are values which are dependent only upon the aldehyde component Q or the alcohol component P of the concerned acetal and are individual consts. for every aldehyde (ketone) and every alcohol. The symbol k_0 is defined as the group const. of dimethyl formal, $CH_2(OCH_3)_2$, so q denotes the value of the ratio of the velocity of hydrolysis of the acetal of the aldehyde (ketone) to that of the formal and p is the ratio of the velocity of hydrolysis of the acetal of the alcohol P to that of the acetal of CH_3OH. The consts. for the acid and alk. hydrolysis for the following compds. are: ethylidene diacetate: 0.00690, 130; ethylidene propionate: 0.00906, 94; ethylidene acetate propionate: 0.00806, 105,

The arithmetic means of the velocity consts. of both pure acetals are: $k_{(acid)} = 0.00798$: $k_{(alk.)} = 112$. J. H. PERRY

Determination of the rate of hydrolysis of sparingly soluble esters. R. CHRISTIE SMITH AND H. A. PATERSON. *J. Chem. Soc.* **1926**, 940–1.—It is suggested that the velocity const. can be detd. for sol. esters by measurement of the amt. of acid produced in a sufficiently long time by a satd. soln., the concn. of the ester being therefore const. Expts indicate that the method is applicable. A. W. KENNEY

The alcoholysis of salts of weak bases with weak acids in ethyl alcohol and methanol. and the dissociation constants of the base ions. HEINRICH GOLDSCHMIDT AND ERLING MATHIESEN. *Z physik. Chem.* **119**, 439–73(1926); cf. *C. A.* **19**, 1519–20.—By cond. methods the alcoholysis of the salts of 9 org. bases with 4 org. acids was detd. in MeOH and salts of 18 bases in EtOH. From the alcoholytic consts. thus obtained the dissocn. consts. of the base ions were calcd. in both MeOH and EtOH. In all cases the base ions are least dissocd. in MeOH. In most cases the dissocn. is less in EtOH than in water, but there are exceptions. The addn. of water to the alcs. depresses the alcoholysis The dissocn. consts. of the base ions in aq. alc. soln. may be affected either way by the addn. of H_2O to the alc. soln. A. W. KENNEY

Some physicochemical and electrochemical aspects of sulfur dioxide as an oxidizing agent. S. R. CARTER. *J. Soc. Chem. Ind.* **45**, 207–10T(1926).—Although SO_2 acts as a reducing agent in dil. acid soln., in strongly acid soln. it may behave as an oxidizing agent. Electro potential measurements were made with cells contg. Fe^{++} and Fe^{+++}, both as chlorides and as phosphates, with varying acid concns. The oxidation potential of the phosphates is much lower than that of the chlorides. The oxidation potential of SO_2 increases with rising acid concn , whereas the other potentials fall. The SO_2 electrode, Pt, SO_2, HCl, S, was not satisfactorily reproducible. The behavior of SO_2 solns on electrolysis suggests also that an intermediate compd. is formed by the SO_2 and S. $H_2S_2O_4$ is suggested. Velocity detns. were made on the oxidation of $Fe_3(PO_4)_2$ with SO_2, and it was found that the reaction proceeds in 2 stages, the first rapid and the second slow and uniform. These expts also suggest an intermediate S compd. Hyposulfurous, thiosulfurous acid, an active form of S, and thionic acid possess some of the requisite properties, but no one of them could definitely be selected. A. W. K.

The kinetics of aquotization. J. N. BRÖNSTED. *Z. physik. Chem.* **122**, 383–97 (1926).—The aquotization of nitratopentammine cobalt ion proceeds, independently of the acidity, as a reaction of the first order. The velocity consts. are: 3.61×10^{-4} and 7.57×10^{-4} at 15° and 20°, resp The aquotization of nitratoaquotetrammine cobalt ions is very sensitive to acids. The velocity consts. at 15° and 20° are, resp., $7.6 \times 10^{-4} + 1.07 \times 10^{-5} \times (1/C_{H^+})$ and $16.0 \times 10^{-4} + 3.2 \times 10^{-5} \times (1/C_{H^+})$. The const. for the aquotization of chloroaquopentammine ions is, at 20°: $1.3 \times 10^{-4} + 1.6 \times 10^{-6} \times (1/C_{H^+})$. The acid sensitivity of the aquo ions is caused by its acid character, due to the existence of the equil.:

$$\left[\begin{matrix} NO_3 \\ CoH_2O \\ (NH_3)_4 \end{matrix}\right]^{++} \rightleftarrows \left[\begin{matrix} NO_3 \\ CoOH \\ (NH_3)_4 \end{matrix}\right]^{+} + H^+$$

The hydroxy ion aquotizes much more readily than the aquo ion. The greater velocity of aquotization of the hydroxy ion in comparison with that of the aquo ion is due to its smaller positive charge The velocity of aquotization can be used in the measurement of H^+ ion concns. The theory of the process of aquotization is discussed at length. J. H. PERRY

A method of investigating chemical reactions in the solid phase. N. SEMENOV AND A. SHALNIKOV. *Z. Physik* **38**, 738–44(1926).—By evapg. 2 substances *simultaneously* on to a surface cooled with liquid air, in a high vacuum, an extremely intimate mixt. is formed. When the evapd. layer becomes so thick that its surface is above a crit. temp. which has not yet been precisely detd. for any of the substances examd., an extremely rapid reaction occurs in an elliptical zone having its center approx. at the point of thickest deposit. After another period of deposition reaction occurs in an area surrounding the original zone, and so on. Expts. were made with Cd and S, Na and S, and Cd and $CdCl_2$. With the latter no reaction occurred. The reaction of Cd and S is complete in less than 0.06 sec. *Explanation.*—When the layer becomes so thick that the crit. temp. is exceeded the reaction proceeds inward toward the surface cooled with liquid air, and spreads sideways from the thickest point, the heat of reaction warming the interior to the crit. temp. When the reaction has spread to points where the deposit is quite thin, the temp. of the layer is too low throughout for this to

occur. Further deposition thickens the edges of the zone which has reacted so that the next reaction starts from them. For Cd and S the crit. temp. is < —130°. A. E. R.

Decomposition velocity of solid substances. II. Velocity of dissociation of cadmium carbonate. M. TZENTNERSHVER AND B. BRUZS. *Z. physik. Chem.* **119**, 405–18 (1926); cf. *C. A.* **19**, 2901.—The decompn. of $CdCO_3$ was studied between 376° and 410° with the app. and by the method already described. There was evident an induction period, the duration of which decreased with rising temp.; but a sample of carbonate once heated no longer showed a period of induction. Presumably the carbonate changes into another solid form before decompg. into the oxide and CO_2. The decompn. is a reaction of the first order and the const. doubles for every 10° rise in temp. The velocity is independent of the surface of the carbonate. A. W. KENNEY

Decomposition velocity of solid substances. III. Dissociation velocity of silver carbonate. M. TZENTNERSHVER AND B. BRUZS. *Z. physik. Chem.* **123**, 111–26(1926); cf. preceding abstract.—The dissocn. temp. of amorphous Ag_2CO_3 was 219° at 760 mm. The decompn. of cryst. Ag_2CO_3 follows the course of a monomol. reaction, whose velocity const., λ, is given by $\ln \lambda = 0.032t - 9.01$. The dissocn. of amorphous Ag_2CO_3 follows 2 consecutive reactions and an explanation is given for the negative temp. coeff. The velocity of the union of $Ag_2O + CO_2$ reaches a max. value between 160° and 200°. **IV. Dissociation velocity of lead carbonate.** TZENTNERSHVER AND A. AWERBUCH. *Ibid* 127–33(1926).—The dissocn. of $PbCO_3$ undergoes an induction period of about 7 min. duration at 272–282°. The reaction takes place in 2 stages; the dissocn. follows a first-order expression. The presence of traces of water accelerates the dissocn. M. F.

The expression of kinetic chemical equations as a time function. S. G. BOTELLA. *Anales soc. españ. fís. quím.* **24**, 400–12(1926).—The form assumed by equations relative to the amt. of substance transformed and the velocity of the reaction as a function of time in unilateral, homogeneous and in reversible monomol. reactions at const. temp. and vol. is shown. The problem can be solved with unilateral reactions of the first and second order, and with multimol. reactions whose initial concns. are the same for all substances, but it cannot be solved when a question of multimol. reactions at unequal initial concns., and also when the differential equation of the velocity of a reversible reaction can assume a partial form like that of the latter. Analysis of the equations obtained removes the possibility, considered by Damianovich, of maxima and minima in the curve of velocity of an isothermic, multimol. reaction. E. M. SYMMES

Production of hydrogen by steam in a hot boiler tube. J. PORTER. *Roy. Tech. Coll. Glasgow* **1925**, No. 2, 14–18; *Sci. Abstract* **29B**, 106.—A short account is given of the chem. action of steam on iron, and expts. are described which show (for the particular case of the action of stagnant steam on a boiler tube) the rapid increase in the rate at which this action takes place when the temp. is raised above or about 500° C. or 900° F. J. H. PERRY

The retardation of the formation of hydrogen bromide by iodine. WALTER MÜLLER. *Z. physik. Chem.* **123**, 1–27(1926).—By a study of the formation of HBr from the elements in borosilicate-glass vessels in the presence of I_2 at 300°, M. has detd. that I_2 retards this formation by combining with some of the Br_2 forming BrI. The reaction $H_2 + BrI \longrightarrow HBr + HI$ is very slow; hence the regeneration of the Br is likewise slow. From the equil. const. $K_{2BrI} = 0.0114$ at 304.8° it was possible to calcd. the dissociation of BrI at 300° as 20%. The temp. coeff. of this reaction was found to be 2.07. E. R. SCHIERZ

The equilibrium $I_2 + Br_2 \rightleftarrows 2IBr$. MAX BODENSTEIN AND A. SCHMIDT. *Z. physik. Chem.* **123**, 28–32(1926).—From vapor d. measurements at 1495° abs. of Br_2, I_2 and a mixt. contg. both in quartz vessels the authors have calcd. the equil. const. of the reaction as 0.093. This agrees with that of obtained by Müller (cf. preceding abstract). E. R. SCHIERZ

Reactions between solid phases. V. The reactions of the alkaline earths with sulfide, carbides, silicides and phosphides. J. ARVID HEDVALL AND E. NORSTRÖM. *Z. anorg. allgem. Chem.* **154**, 1–29(1926); cf. *C. A.* **19**, 915.—Contrary to general belief, $ZnSO_4$ is not formed as an intermediate compd. in the oxidizing roasting of ZnS. The reaction goes according to the equation $MO + ZnS + 2O_2 = MSO_4 + ZnO$, where M designates an alk. earth metal. The total reaction, $MO + Ag_2S + 2O_2 = MSO_4 + 2Ag + 0.5O_2$, is the sum of the two reactions: $MO + Ag_2S + 2O_2 = MSO_4 + Ag_2O$ and $Ag_2O = 2Ag + 0.5O_2$. A direct reaction between alk. earth and Cu_2S according to the scheme $MO + Cu_2S = MS + Cu_2O$ is not possible. In presence of O_2 the reaction is $MO + Cu_2S + 2O_2 = MSO_4 + Cu_2O$. The results of the studies of this particular reaction with the oxides of Ba, Sr, Ca and Mg furthermore suggest that CuS has a transition point slightly below 375°. The fact that CuS oxidizes spontaneously in presence of

O_2 with the formation of SO_2 at 383° supports this view. The following 3 reactions also take place in the solid phase: $4MO + 2Cr_5C_2 + 11.5O_2 = 4MCO_3 + 5Cr_2O_3$; $4MO + 2FeSi_2 + 5.5O_2 = 4MSiO_3 + Fe_2O_3$ and $3MO + Ca_3P_2 + 4O_2 = M_3(PO_4)_2 + 3CaO$. Expts. with AlN were unsuccessful because the nitrates of the alk. earth metals which should have formed were decomposed, at the operating temp. P. K. F.

The ternary system sodium metasilicate-calcium metasilicate-silica. G. W. Morey and N. L. Bowen. *J. Soc. Glass Tech.* **9,** 226-64(1925).—In a very comprehensive way the ternary system $Na_2O.SiO_2$-$CaO.SiO_2$-SiO_2 was investigated by the quenching method. Three new compds. were found and their properties detd.: $2Na_2O$ - $CaO\ 3SiO_2$, which melts incongruently to form a liquid richer in Na_2SiO_3 and Na_2O - $2CaO\ 3SiO_2$; the compd. $Na_2O\ 2CaO.3SiO_2$, which has a congruent m. p. at 1284°; and the compd. $Na_2O\ 3CaO\ 6SiO_2$, melting incongruently at 1045° to form a mixt. of wollastonite and a glass contg. about 15% CaO and 67% SiO_2. These compds. are all characterized by a large amt. of dissocn. in the liquid phase. The m. p surfaces of the various unary, binary and ternary compds. existing as solid phases were detd., the results being given in graphic and tabular form. The relation between the surfaces giving the solid-liquid equil. as a function of temp. and the properties of the liquids as detd. by other investigators is discussed. The facts presented are related to the speculations on the constitution of glass. H. F. K.

The kinetic equations of homogeneous catalysis. Eugene Spitalsky. *Z. physik. Chem.* **122,** 257-96(1926).—Detailed discussion, and mathematical treatment of the intermediate-compd. theory of homogeneous catalysis. Assuming that the velocity of decompn. of the intermediate compd. is proportional to its concn., the apparent order of the reaction is shown to be dependent on the consts. of the equil. between catalyst and substrate. When two or more compds. may be formed, with varying lability, the reaction velocity may simulate a number of other cases such as auto-catalysis, and may even show successive maxima and minima. A number of hypothetical cases with different consts. are calcd. B. H. Carroll

Catalytic action considered as a surface action. G. R. Levi and R. Haardt. *Gazz. chim. ital.* **56,** 424-9(1926).—It has already been shown (*C. A.* **20,** 2947; *Rend. accad. Lincei* [6] **3,** 91, 215(1926)) that the particle size of metals of the Pt group pptd. from soln. can be measured as accurately by x-rays as can colloidal particles ultramicroscopically. This was utilized to det the *relation between the rate of the catalytic decompn of H_2O_2 and the particle size of the Pt catalyst.* The work represents the 1st quant measurements of the kind, that of Taylor, Clark, Wyckoff and others being essentially qual. Pt samples of progressively increasing particle sizes were prepd. by pptn from H_2PtCl_6 in acid soln. with Al at 60° and heating the products to different temps The higher the temp. to which the Pt was heated the coarser the particles, *e. g*, the surface of a given quantity being 5588 cm.^{2} at 60° and decreasing to 1385 cm.^{2} after 12 hrs. at 215°. This shows in turn that heating a metal catalyst greatly impairs its catalytic power. In 2 series of expts at different concns. of H_2O_2, it was found that the amt. of H_2O_2 decompd. in a given time varied with the particle size of the Pt Thus with Pt prepd. at 60°, the % H_2O_2 decompd. were 24.5, and 23.2%, resp., whereas with Pt prepd at 215°, the corresponding values were 19.3 and 20 9%, resp. The curves representing the % H_2O_2 decompd. as a function of Pt surface area show that above a definite limit, no further increase in the rate of decompn. occurs on increasing the surface area of the catalyst. With 0.01 g of Pt and 50 cc. of dil H_2O_2 (5-6 g. per l.) at 20°, there was almost no increase in the rate on increasing the surface area of the Pt above 3000 cm.^{2} The trend of the curves also shows that as the surface area decreases, the decrease in the catalytic power becomes relatively greater. Allowing for other influences, the expts. indicate that the catalytic power of a metal is predominantly a function of its surface area. C. C. Davis

Possible mechanism for the lowering of the heat of activation of a reaction by a catalytic surface. Robt. E. Burk. *J. Phys. Chem.* **30,** 1134-40(1926).—To explain the mechanism by which the heats of activation can be lowered by a catalytic surface B. postulates the partial breaking down of a mol. by adsorption at 2 or more points. To accomplish this partial sepn. of *A* and *B* in the mol. *AB* it is necessary for both atoms to be attached to the surface and the adsorbing atoms must be so spaced that the distance between the points of max. intensity in their attractive forces is not quite the same as the corresponding distance in the mol. *AB*. Evidence in support of this multiple adsorption theory is given and the actions of promoters and catalytic poisons are interpreted by the aid of this concept. Harry B. Weiser

The catalytic dissociation of carbon monoxide. John Cleminson and H. V. A. Briscoe. *J. Chem. Soc,* **1926,** 2148-54.—CO prepd. by the dehydration of HCO_2H,

in contact with clean glass does not dissociate appreciably at 300°; the presence of MgO and Al_2O_3 enables the reaction $2CO \longrightarrow CO_2 + C$ to proceed at temps. below 300° and, in the case of Al_2O_3, as low as 250°. The extent of decompn. when equil. is attained in the presence of Al_2O_3 increases progressively with temp., being 5.35% at 250° and 12.25% at 290°. The degree of dissocn. was measured by change in pressure. Diagrams and descriptions of the app. are given. E. R. SCHIERZ

How I have been led to the direct hydrogenation method by metallic catalysts. PAUL SABATIER. *Ind. Eng. Chem.* **18,** 1005–8(1926).—Faith in the theory of temporary compds. furnished by the catalyst constantly guided S. in his work, a review of which is here given. S. believes that Ni forms NiH_4 and NiH_2, and that the H is given off readily by these compds. in hydrogenation by use of Ni catalyst; they act as "temporary hydrides." W. C. EBAUGH

The decomposition of hydrogen peroxide in the presence of certain hydroxides in suspension. SUZANNE VEIL. *Compt. rend.* **182,** 1028–31(1926); cf. *C. A.* **19,** 1804.—Certain metallic hydroxides acting as catalyzers for the decompn. of H_2O_2 have been found to alter their magnetic properties progressively during the catalysis. The magnetism of $Fe(OH)_3$ decreases, while that of its ignited oxide passes through a max. while it functions continuously as a catalyzer. $Cr(OH)_3$ behaves like $Fe(OH)_3$. The max. of its oxide is less marked. A. W. K.

Intermediate reactions in catalysis. ANDRÉ JOB. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926,** 417–43.—A number of simple catalytic reactions are discussed and it is shown that by a number of suitable assumptions they can be explained by the formation of unstable electronic complexes, which decompose giving the final product of the reaction and regenerating the catalyzer. Though the assumptions may be more or less arbitrary, the reasoning can give instructive results, and in some cases already has. The examples dealt with are the catalysis of: $NH_3 + HCl = NH_4Cl$, $H_2 + Cl_2 = 2HCl$, hydrolysis, fermentation of glucose, and a number of oxidation reactions A. PAPINEAU-COUTURE

Developments resulting from the theory of catalytic phenomena in heterogeneous reactions. E. K. RIDEAL. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926,** 454–80.—A review and discussion of the consequences following from the work of Rayleigh, Hardy and Langmuir, which has established that the seat of catalytic activity is limited to the film of reacting substances adsorbed at the surface of the catalyzer. A. P.-C.

Catalysis by solid surfaces. E. F. ARMSTRONG AND T. P. HILDITCH. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926,** 493–518.—A review dealing chiefly with hydrogenation and dehydrogenation of gases or of gas-liquid systems at the surface of metallic catalyzers, bringing out the problems on which a more or less general agreement has been reached, and those which remain to be solved. A. P.-C.

Autoxidation and catalytic phenomena related thereto. CHARLES MOUREU AND CHARLES DUFRAISSE. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926,** 524–80.—A review describing the phenomena and general conditions of autoxidation, catalysis in autoxidation and accessory phenomena A. PAPINEAU-COUTURE

The activation of hydrogen by iron. SHIGERU TODA. *Biochem. Z.* **172,** 34–5 (1926).—When cysteine and methylene blue are mixed the methylene blue becomes reduced and the cysteine is oxidized to cystine. Warburg regards this reaction as being promoted by a heavy-metal catalyst because it is inhibited by HCN, and this seems corroborated by exptl. evidence. When the reaction is carried out with com. reagents, the discoloration due to the formation of the leuco compd. is brought about in about 25 min. Upon the addn. of 0.001 *M* HCN the reaction is slowed up 10 times. If, however, cysteine and methylene blue are specially prepd. and repeatedly purified to free them of Fe the reaction becomes very slow (300 min.). The addn. of traces of Fe in the form of $FeSO_4$ to the purified reagents immediately increases the rate, so that even 10^{-5} g./atom of Fe per l. suffices to bring about complete decoloration in 7 min. S. MORGULIS

The catalytic oxidation of hydrocyanic acid. II. HEIMA SINOZAKI AND RYOSABURO HARA. *Tech. Repts. Tôhoku Imp. Univ.* **6,** 95–120(1926); cf. *C. A.* **19,** 3198.—A continuation of earlier expts. on the catalytic oxidation of HCN by air to form NO. The catalysts used were Pt asbestos; Fe_2O_3; Fe_2O_3 95%, Bi_2O_3 5%; Fe_2O_3 85%, Bi_2O_3 15%; Fe_2O_3 70%, Bi_2O_3 30%; Co_3O_4; Co_3O_4 85%, Bi_2O_3 15 %; CuO; NiO; Cr_2O_3; Mn_2O_3; MnO_2 85%, CuO 15%; porcelain and silica. The last 2 substances were practically inactive catalytically. The method employed was similar to that previously described. All expts. were made at atm. pressure. All the oxide catalysts displayed considerable catalytic activity, particularly the $Fe_2O_3 + Bi_2O_3$, Co_3O_4, $Co_3O_4 + Bi_2O_3$ and MnO_2 + CuO; their activity being almost equal to that of Pt gauze. In order to obtain a high

yield of NO (80 to 95% NO in the exit gas at 700°), it was necessary that the time of contact of the gas be less than 0.01 sec. for Pt asbestos. With the less active oxide catalysts the optimum time of contact varied with the catalyst. The activity of some of the catalysts, particularly Fe_2O_3, could be markedly increased by preliminary activation at 500–700° with 30% HCN—70% air. Reaction at comparatively low temps. over activated Fe_2O_3 led to the formation of some solid products, among which were identified cyamelide, cyanuric acid, ammonium cyanate and urea. This fact lends probability to the hypothesis of intermediate formation of HCNO. R. L. Dodge

Determination of the equilibrium of the reaction: $2IO_3^- + 10Br^- + 12H^+ \rightleftarrows I_2 + 5Br_2 + 6H_2O$. Alfred Schwicker and Géza Schay. *Z. physik. Chem.* **122**, 482–4(1926).—Three different methods were used: (1) a measured vol. of equil. mixt is washed with 5 cc. of 15% alkali and 1 cc. H_2O_2. The mixt. is cooled, acidified, KI is added and the I titrated with $Na_2S_2O_3$ (2) An acid 5% phenol soln. is added to the equil. mixt. (3) An alk. soln. of phenol is added to the equil. mixt. and after acidification the iodate is detd. The mean of 14 expts. at 25° gives an equil. const. for this reaction of 1.6×10^{-22}. J. H. Perry

The water equilibrium. W. D. Bancroft. *J. Phys. Chem.* **30**, 1194–1201(1926).—B. divides liquid water into hydrol and polyhydrol, the latter being a polymerized form of the former. An equil exists between them. The greater peptizing action of KI over KCl on gelatin in water is ascribed to the water equil. being moved in the direction of more hydrol, the peptizing agent. A displacement of the water equil. may account for variations in the diln. laws and for effects of neutral salts on p_H values. The Debye theory of solubilities will not apply if the water equil. is displaced by addn. of a second salt. Raymond H. Lambert

The equilibrium between carbon monoxide, carbon and carbon dioxide. The reaction between ferrous oxide and carbon, and between carbon monoxide and iron. Victor Falcke and Walter Fischer. *Z. Elektrochem* **32**, 194–201(1926).—Numerous detns. of the equil const. for the reaction $C + CO_2 = 2CO$ may be expressed $\log K_p = -(8351/T) + 0.242 \log T - 5.65 \times 10^{-4T} + 4.60 \times 10^{-8T^2} - \log T + 9.504$. The heat of the reaction (van't Hoff equation) is 36,600 cal. at $T = 958$. In the presence of excess free iron the reaction is not $CO_2 + Fe = CO + FeO$. FeC_3 is formed and hence in presence of iron, not satd. with C, the equil. consts. deviate from the above equation decidedly. F. R B.

A generalization of the phase rule and its application to osmotic, thermoösmotic and electroösmotic systems in particular. Ernesto Denina. *Gazz. chim. ital.* **56**, 357–65(1926).—Though Gay has extended the phase rule to systems in which the pressure varies from phase to phase (cf. *C. A* **19**, 1982) at const. temp., it is possible to generalize the rule still further and det. a relation between the no. of phases and the variance for any system whatever. By mathematical reasoning the phase rule in its most generalized form is $V = P - (C + \phi)$, where V is the variance, P is the no. of variable parameters (pressures, temps., concns., elec potentials, etc.) and ϕ is the no. of phases. When the system is at uniform temp. but the pressure varies among the phases, $P = (n + 1)\phi + 1$, where n is the no. of independent components. Since the phases are in contact with each other, with free exchange of components, $C = n(\phi - 1)$ and $V = (n + 1)\phi + 1 - [n(\phi - 1) + \phi] = n + 1$, conforming to the value obtained by Gay (*loc. cit.*). When the pressure is the same throughout the system, with the other conditions as before, $P = n\phi + 2$, $C = n(\phi - 1)$ and $V = n\phi + 2 - [n(\phi - 1) + \phi] = n + 2 - \phi$, which is the usual expression of the phase rule. The ordinary expression for the phase rule is therefore only a special case of the more general form. Several typical applications are presented in detail. Thus in a *circuit of 2 metals* M_1 and M_2 with the 2 contacts at different temps. T_1 and T_2, ϕ is 4, *i. e.*, M_1 at T_1, M_1 at T_2, M_2 at T_1 and M_2 at T_2. The phases comprising 1 metal at different temps. can be regarded as a contact through a semipermeable membrane by electrons (elec. energy), and the phases comprising the 2 metals at a const. temp. can similarly be regarded as a contact both by a similar membrane and by a 2nd membrane permeable to thermal energy. The latter can be neglected, however, since the temp. is const. Therefore P is 9, *i. e.*, T_1 and T_2, 3 independent elec. potentials and 4 concns. of free electrons in the 4 phases, and since C is 4, $V = 9 - (4 + 4)$, or a monovariant system. Similarly in a *galvanic pile at const. temp. formed of solns. of 2 salts with immersed metal electrodes* of the same metal as the cation, P is 8 and ϕ is 3, and C is 3 (assuming the metals to be in contact with the solns. through membranes semipermeable to the corresponding cations and with each other through membranes permeable to electrons). Therefore $V = 8 - (3 + 3)$, or a bivariant system. This conforms to the Nernst theorem, dealing with the relation between concns. and soln. tensions of 2 metals. With an *osmotic cell*, where

2 solns. of differing concn. of a substance are in contact, P is 9 (the concns. of solvent and of solute in each phase, the temp. and pressure of each phase and the p. d.) and C is 1, so that $V = 9-(1+2)$ or 6. The usual osmotic system is, however, univariant, since the concn. of the solute, the temps., the pressure of 1 phase and the p. d. are usually fixed. With other parameters fixed, *thermoösmotic*, *electroösmotic* and *thermo-electroösmotic systems* are obtained. A study of the relation between such systems should be of potential value in explaining the nature and the compn. of solns. By adding a 3rd soln. in osmotic contact with each of the preceding phases, a more complicated system is obtained, C being 3, P 11 and V 5. Such applications of the phase rule in its most generalized form can be extended indefinitely. C. C. Davis

Two examples of backward-sloping curves in anisotropic binary systems. Franz Wever. *Z. anorg. allgem. Chem.* **154**, 294–307(1926).—The binary systems: Fe–Si and Fe–Sn have been studied and shown to give the backward sloping temp.-compn. curve which results when, in an anisotropic binary mixt., one component suppresses a transition of the other component Per K. Frolich

The influence of pressure on the equilibrium of binary systems. III. *m*-Chloronitrobenzene, *m*-bromonitrobenzene and their mixtures at high pressures. N. A. Pushin. *Z. physik. Chem.* **119**, 400–4(1926); cf. *C. A* **20**, 1164.—Pure *m*-chloronitrobenzene and *m*-bromonitrobenzene and their mixts between 30 and 50 mol. % of the latter have been studied with p and t as variables up to pressures of 2500 kg./sq. cm and temps. between 40° and 110°. In all cases a continuous series of solid solns. formed in which the compn. of the solid was very close to that of the liquid phase. A. W. K.

The system water-acetic acid–toluene: Triangular diagram at 25°, with densities and viscosities of the layers. R. M. Woodman. *J. Phys. Chem.* **30**, 1283–6(1926).—The crit point for the system at 25° contains only a small amt. of water and nearly equal percentages of acetic acid and toluene. D. and viscosity of the aq layers pass through a max. which is higher than that of pure acetic acid at the same temp. The toluene layers have ds. and viscosities which continuously increase as the compn. approaches the critical point. Raymond H. Lambert

The space diagram for the ternary system sodium hydroxide–sodium chloride–water. A. v. Antropoff and W. Sommer. *Z. physik. Chem.* **123**, 161–98(1926).—The ternary system $NaCl$-$NaOH$-H_2O was studied by thermal analysis from 150° to 800°, extending previous results by A. (*C. A.* **19**, 1526). Scarpa's values for the binary system $NaCl$–$NaOH$ (*C. A.* **9**, 2828) have been confirmed with similar app. The system $NaOH$–H_2O has been studied and Gerlach's curve for the boiling points (*Z. anal. Chem.* **26**, 418(1887)) have been corrected and extended above 200°. The "second boiling points" of the system NaCl, H_2O were detd. The behavior of a ternary system with mixed crystals is discussed theoretically for the case where components pass through transition points. A detailed discussion of technic and complete data are given. R. W. Ryan

The system: sodium sulfate–sulfuric acid–ethyl alcohol. H. B. Dunnicliff, Indar Sain Sikka and Rattan Chaud Hoon. *J. Phys. Chem.* **30**, 1211–18(1926).—Of various possible components considered in the system the most satisfactory is that of Na_2SO_4, free H_2SO_4 and solvent consisting of alc., $EtHSO_4$ and H_2O The change of phase from one compd to another is indicated in tables and in graphic form. Colloidal phenomena cause many difficulties in establishing this system. R. H. L.

A study of the constitution of ternary systems. W. Guertler. *Z. anorg. allgem. Chem.* **154**, 439–55(1926).—Ternary systems of metals are discussed. P. K F.

The chemistry of metallic systems. Arne Westgren and Gösta Phragmén. *Z. Metallkunde* **18**, 279–84(1926).—In a study of the chemistry of alloy phases the type of crystal lattice is of more significance than mol. forms, and mixed crystals as a rule are the result of reactions between atoms rather than mols. Solid solns. formed as a result of complex substitution may be regarded as exceptions. An x-ray analysis is made of the alloys Cu-Zn, Cu-Al, and Cu-Sn, and photograms are shown. These clearly indicate the presence of structural similarity, which is likewise brought out in equil. diagrams. In both Cu-Zn and Cu-Sn there is a phase with hexagonal structure, having a homogeneous range in Cu-Zn of 80–86 atomic % Zn, and in Cu-Sn of about 25 atomic % Sn. This phase is absent in Cu-Al. The no. of atoms in the elementary prism is found to be 2. In each alloy there is a phase with cubical structure, the elementary cube in Cu-Zn contg. 52 atoms; in Cu-Al, 52 atoms, but only in the Cu-rich range, for as the Al concn. increases the no. of atoms in the cube falls to 49. The cubical lattice in the Cu-Sn alloy has double the parameter of the corresponding Cu-Zn and Cu-Al phases. The lattice of the Cu-Sn phase is of the face-centered type, and from the sp. gr., lattice parameter and wt. of the atom, the no. of atoms in the elementary

cube is found to be 416, which is 8 times as great as the no. of atoms in the corresponding Cu-Zn and Cu-Al phases. There is still a 3rd type of structure present in all 3 alloys, at about 50 atomic % Cu in Cu-Zn, and probably at 25 atomic % Al in Cu-Al and 15 atomic % Sn in Cu-Sn. This phase consists of 2 simple cubic lattices. The systems Ag-Zn, Ag-Al and Ag-Sn also were studied. The structurally analogous phases in these systems cover a large concn. interval, from about 71-85 atomic % Zn in Ag-Zn, 28-45 atomic % Al in Ag-Al and 11-23 atomic % Sn in Ag-Sn. In general it can be said that the structurally analogous phases are displaced toward the Cu or Ag side of the diagram as the valence of the metal alloyed with Cu or Ag rises H. STOERTZ

Pseudoternary systems containing sulfur. I. Sulfur and quinoline, pyridine and *p*-xylene. D. L. HAMMICK AND WM. E. HOLT. *J. Chem. Soc.* **1926**, 1995-2003.—Data for the 3 systems S and quinoline, C_5H_5N and p-$C_6H_4Me_2$ are given in tables and curves. In the 1st and 3rd systems the attainment of internal equil. in the phases contg. liquid S results in a lowering of the mutual miscibility of those phases. In the system S-p-$C_6H_4Me_2$ the soly. of the liquid equil. S is definitely less than that of the labile Sλ. The critical soln. temp. in p-$C_6H_4Me_2$ is 190° for Sλ. The original should be consulted for the numerical data. C. J. WEST

The equilibrium of heterogeneous systems including electrolytes. I. Fundamental equations and phase rule. J. A. V. BUTLER. *Proc. Roy Soc.* (London) **112,** 129-36(1926).—The mathematical method employed by Willard Gibbs is here applied to systems contg. electrolytes by the addn. of another variable, the elec. potential. The general conditions for equil. are derived, and a modified form of the phase rule and its application to galvanic cells are discussed. A. W. KENNEY

Phases in the ternary system ferric chloride-ferric oxide-water. EMIL BAUR. *Z. Elektrochem.* **32,** 428-30(1926).—A short review is given of the work of E. Stirnemann (*Neues Jahrb. Mineral. Beil.* **52A,** 334-77; **53A,** 59-94(1925)) on the $FeCl_3$-Fe_2O_3-H_2O system at all temps., particularly important for petrogenesis. Two p-T and p-T-x diagrams of this system (x for Fe_2Cl_6-Fe_2O_3) running up to 1500° are reproduced. The range of existence of FeOCl is limited on one side by a quadruple point at 525° ± 3° and 11.7 atm. for $Fe_2O_{3\,sol.}$, $FeOCl_{sol}$ $FeCl_{3\,liq}$, and vapor, at the lower end by a quadruple point $Fe_2O_{3\,sol.}$, $FeOCl_{sol.}$, $FeCl_{3\,sol}$. and vapor at 110° (extrapolated). Beyond the upper quadruple point the 3-phase line Fe_2O_3, $FeCl_3$, vapor runs through a max. and terminates at the hematite m. p. at 1550°. Part of this line is cut off by the "Faltenpunkt" line of the critical points of the $FeCl_3$-Fe_2O_3 soln., starting at the critical point of pure $FeCl_3$ at 650° and 45 atm. and ending at the unknown critical point of Fe_2O_3. The region of these fluid phases without actual condensed phase appears most important for rock formation; it allows distn. to the surface of little volatile substance. In the presence of water three gas equilibria: $2FeOCl + H_2O = Fe_2O_3 + 2HCl$; $Fe_2Cl_6 + 2H_2O = 2FeOCl + 4HCl$; $Fe_2Cl_6 + 3H_2O = Fe_2O_3 + 6HCl$ must be considered. The last, above 525°, is derivable from the first two. In an isobaric T-x diagram (x for HCl-H_2O) the limits of existence of FeOCl as detd. by the gas compn are shown for p = 20 atm. B. J. C. VAN DER HOEVEN

The oxidation potential of the system selenium dioxide-selenium. S. R. CARTER. J. A. V. BUTLER AND FRANK JAMES. *J. Chem. Soc.* **1926,** 930-7.—The system SeO_2-Se in concd. HCl gives a reproducible oxidation potential which is not affected by light. Ten-fold changes in concn. produce a change in potential of 0.022-0 028 v. Provisionally, it is assumed that $SeCl_4$ forms as an intermediate step and yields Se^{++++} ions. A. W. KENNEY

Decomposition of carbon dioxide by an electric spark at reduced pressure using a condenser. PIERRE JOLIBOIS, HENRI LEFEBVRE AND PIERRE MONTAGNE. *Compt. rend.* **182,** 1026-8(1926).—The course of the reaction $CO_2 = CO + {}^1/_2O_2$ under the influence of high-potential discharge was followed by the change in pressure in a closed system. The initial pressures varied from 0.3 to 20 mm. The number of sparks in each expt. varied from 1 to 50. A condenser of approx. 2.25 microfarads was used and initial voltages of the order of 2400. As high as 90% dissocn. was reached and the efficiency from an energy standpoint is about 20%. A. W. KENNEY

The influence of the capacity in the discharging circuit on the decomposition of carbon dioxide by an electric spark at reduced pressure. PIERRE JOLIBOIS, HENRI LEFEBVRE AND PIERRE MONTAGNE. *Compt. rend.* **182,** 1145-6(1926).—A series of expts. similar to those described in earlier work were tried with capacities in the circuit varying from 1.1×10^{-3} to 10.8 microfarads. The decompn. of the gas is greatly increased by increasing the capacity. Cf. preceding abstr. A. W. KENNEY

Neutral salts in a high-tension field. R. KELLER AND J. GICKLHORN. *Biochem. Z.* **172,** 233-41(1926).—With Fürth's high-tension app. whereby min. currents, 0.001

amp., are generated under 500–800 v., it was discovered that not only H_2O, colloids, non-electrolytes and ions migrate in the field but, under conditions completely excluding electrolysis, the migration of even neutral salts towards the cathode is demonstrable. Whether this phenomenon depends upon an elec. polarity of the neutral salt or upon its passive carriage by the water flowing to the cathode is not certain, but the fundamental significance of this fact is discussed in relation to various metabolic processes.
S. MORGULIS

The electrification of glass by rubbing. FRANCESCO RIZZI. *Rend. accad. fis. mat. Napoli* **30,** 174–80(1924).—At ordinary temp. glass is electrified + by rubbing with silk or cat fur. At high temp., however, the electrification is −. For 17 samples of glass and for fused quartz the minimum temp. at which silk produced − electrification was about 260°; for porcelain, 390°. The minimum temp. with cat fur was somewhat lower and very irregular, ranging from 40° for fused to about 230–270° for glasses. Glass heated to the inversion point, and then cooled almost to the surrounding temp., acquires a − charge on the first rubbing with silk, but soon changes to +. If cooled completely to the surrounding temp. a + charge is acquired at first rubbing. After being heated to 600°, considerably above the inversion point, the capacity for − electrification persists much longer. If such a sample is brought back to a + state by continued rubbing with silk, further rubbing with cat fur will render it − again. After immersion in liquid air, glass, sealing wax, ebonite, quartz and porcelain are charged strongly − by silk or cat fur, but the effect lasts only a few min. The relation between the composition of a glass and the intensity of the electrification produced by rubbing with silk taffeta was detd. Polished, optically flat surfaces acquired a greater charge than surfaces ground with emery, probably because of the greater contact surface of the former. Crown glasses become more highly charged than flint glasses. Borosilicate crown and light flint were intermediate, while crown, transparent to ultra-violet light, and heavy flint had, resp., the largest and smallest charges. R. H. LOMBARD

Nitric acid. II. The behavior of nitrous acid at the anode. ALFONS KLEMENC AND PHILIPP GROSS. *Z. anorg. allgem. Chem.* **153,** 332–8(1926).—The anodic oxidation of nitrites was carefully studied by observation of the anode potential and the c. ds. under increasing applied e. m. fs. in nitrite solns., acid with CO_2 or alk. with Na_2CO_3. It was found that ϵ, the anode potential, is a linear function of log i/c, where i is the intensity of the current and c is the concn. of the electrolyte. Hence the authors conclude that the alkali nitrites are oxidized at the anode even before the potential is high enough to produce the evolution of O_2. The mechanism of the oxidation reaction is discussed but at present a definite conclusion cannot be given. **III. The partial pressures of aqueous solutions of nitric acid at 12.5° and 30°. Vapor tensions of hydrochloric acid at 12.5°.** ALFONS KLEMENC AND ALFRED NAGEL. *Ibid* **155,** 257–68(1926).—The object was to obtain accurate values of the partial pressures of HNO_3 and of H_2O above solns. of HNO_3 by the dynamic method of detg. the amt. of acid and H_2O in a known vol. of N_2, drawn through the soln. The app., specially designed to effect the removal of the last traces of HNO_3 from the aspirating gas, is described in detail. In the cases of the concd. solns. a static method was employed. Tables of the partial pressures of H_2O and HNO_3 for solns. from 0 to 24.0 N are given. The values of the partial pressures of HCl and H_2O over HCl solns. from 1.95 to 6.34 N were also detd. It is noticed that for solns. of equal normality the partial pressure of HNO_3 is greater than that of HCl in dil. solns. while the reverse is the case in concd. solns. At 12 5° 4.8 N solns. of HNO_3 and HCl have the same partial pressures of acid, *viz.* 2.10×10^{-3} mm. Hg. The vapor-pressure curves give evidence of only one hydrate, HNO_3 $2H_2O$, in 14 N solns. R. E. GIBSON

Measurements with the aid of liquid helium. II. Resistance of gold, zinc, cadmium, platinum, nickel, iron and silver to 1.3° K. W. MEISSNER. *Z. Physik* **38,** 647–58(1926); cf. *C. A.* **20,** 864.—The resistances of single crystals of Au, Zn and Cd were detd. at low temps. and with various axis angles. The other metals were studied only in the form of wires. Although very pure metals were used there was no tendency toward infinite cond. Cond. is lower for Cd if Pb is absent. This does not mean that metals studied might not show a large decrease in resistance at temps. lower than the lowest reached (1.34° abs.). W. ALBERT NOYES, JR.

The effect of neutral salts on the potentials of glycocoll solutions as compared to the hydrogen electrode. S. KAWAI. *J. Biochem.* (Japan) **6,** 101–15(1926).—Various cations have the effect of diminishing the p_H and thus increasing the acid dissocn. const. of glycocoll and decreasing basic dissocn. const. This effect of the neutral salts upon an ampholyte substance is, therefore, essentially the same as was found for very dil. acids or alkalies. S. MORGULIS

The heat of dilution of ammonium nitrate. B. LERNER-STEINBERG. *Z. physik. Chem.* **122,** 121–5(1926).—The heat change when 1 mol. NH_4NO_3 and 2.5 mol. H_2O has been dild. to 1 mol. NH_4NO_3 and *m* mols. H_2O has been measured at 18.2°, 21.6° and 25°. The results are tabulated and a graphical record shows the errors in measurements are very small. From the results a temp. coefficient is calcd. R. H. L.

The heat capacity of calcium silicate. G. S. PARKS AND K. K. KELLEY. *J. Phys. Chem* **30,** 1175–8(1926).—The heat capacity of pseudo-wollastonite has been measured from liquid-air temps. up to that of the room. From a knowledge of heat capacities of CaO and SiO_2 at corresponding temps. it is found that Kopp's law holds very well except at low temps. RAYMOND H. LAMBERT

The measurement of heat of wetting of active charcoal by liquids. K. ANDRESS AND E. BERL. *Z. physik. Chem.* **122,** 81–7(1926).—A calorimeter is described in which very small heat effects can be measured with accuracy. The heat of wetting of active charcoal with an excess of liquid present has been detd. for H_2O, Et_2O, C_6H_6, H_2SO_4, EtOH, MeOH and $C_2H_2Cl_4$ The value for H_2O is 12.35 cal. and for org. liquids about 30 cal. per g of active charcoal RAYMOND H. LAMBERT

Optical determination of the heat of dissociation of halogens. J. KOENIGSBERGER. *Naturwissenschaften* **14,** 779(1926); cf. Kuhn, *C. A.* **20,** 3390.—Kilchling, Vogt and the author have found for the convergence point of the edges of the I band spectrum a wave length between 5055 and 5060 A. U., which is different from the one of Mecke at 4995 A. U. (*C. A.* **17,** 2994), which is used by Kuhn. By calcn. from the former value, according to Franck's formula, the dissocn. heat of I is found to be 34.5 cals, identical with the thermodynamic value B. J. C VAN DER HOEVEN

Heats of mixing water with acetic acid and with isopropyl alcohol. C SANDONNINI. *Atti. accad. Lincei* [6] **4,** 63–8(1926).—Though the thermochemistry of liquids which evolve heat when mixed with water has been studied systematically (cf. S. and Gerosa, *C. A.* **20,** 1929), there are few data on mixts which absorb heat. *HOAc-water.*—This system has already been studied by Bussy and Buignet (*Compt. rend.* **59,** 672(1864); **64,** 330(1867)). In the new expts. at 15–18°, heat was evolved in all mixts. up to 32% HOAc, whereas with higher amts. of HOAc heat was absorbed on mixing. By plotting the compn. against the heat change involved, the curve had a max. (heat evolution) at about 20% HOAc (by wt.) and a min. (greatest absorption) at about 80% HOAc. This max. and min. and the crit. compn. at which heat evolution changes to absorption vary with the temp. of the constituents when mixed. With decrease in the temp. the max. increases and the range of concn. where heat is evolved becomes more extensive. *Water-iso-PrOH.*—This system was measured in comparison with the system water-PrOH (cf. Bose and Bose, *C. A.* **1,** 1820). On the same basis as the previous system, the curve had a max. (evolution) at about 25% and a min. (greatest absorption) at about 95% iso-PrOH. Heat was evolved in mixts. up to 93% iso-PrOH and absorbed in mixts. above this % iso-PrOH. The max. evolution of heat occurred at about the same concn. as the max. sp. heat of the mixt. The 2 liquids, which by themselves are highly assocd., undergo on mixing a dissocn. into simpler mols., which is accompanied by heat absorption. Part of these simpler mols. then recombine to complete mols. of the 2 substances, a reaction which is exothermic and involves only a slight affinity, so that a small increase in temp. causes dissocn. into the simple mols. of the 2 liquids. Therefore the variations in the heats of soln. of substances which on mixing absorb heat should be of opposite sign to those which occur in mixts. which evolve heat. C. C. DAVIS

A nomogram for the van't Hoff-Arrhenius temperature equation. O. W. RICHARDS. *J. Phys. Chem.* **30,** 1219–21(1926).—A nomographic chart has been devised in which, from the temps. and velocity consts. of the van't Hoff-Arrhenius equation, the thermal increment can be quickly obtained. The chart is valuable for sepn. of vital phenomena, although the results obtained may be 2–3% in error. R. H. L.

Isothermal calorimetry. H. v. WARTENBERG AND B. LERNER-STEINBERG. *Z. physik. Chem.* **122,** 113–20(1926).—Isothermal calorimeters in general are reviewed and the difficulties of operating them are enumerated. The authors used an open calorimeter of the compensating type for measuring heats of diln. of NH_4NO_3. A change in temp. of 0.1° can be obtained to 1% accuracy. The water water value and standard temp. need only be known to 5% accuracy while the heat capacity of the app. in the calorimeter may be neglected. RAYMOND H. LAMBERT

Latent heats of vaporization. MARC DE HEMPTINNE. *Bull. sci. acad. roy. Belg.* **12,** 296–308(1926).—The observed latent heats of vaporization, *L,* were compared with those calcd. by the equation $L = a(Tc - T)^n$ (cf. *C. A.* **19,** 1220). The consts. *a* and *n* are as follows: H_2O 1.692, 0.313; NH_3 0.815, 0.376; C_5H_{12} 0.815, 0.397; C_6H_{14} 0.914,

0.393; C_7H_{16} 1.063, 0.382; C_8H_{18} 1.096, 0.388; CCl_4 0.940, 0.379; PhCl 1.359, 0.335; PhF 0.936, 0.393; C_6H_6 0.9599, 0.382; MeOAc 0.943, 0.392; EtOAc 0.949, 0.404; MeOH 1.254, 0.369. Good agreement results in all but the last 3. A. W. Francis

Latent heat of evaporation and surface tension. W. Herz. *Z. anorg. allgem. chem.* **155,** 348–50(1926).—Without any reference to possible thermodynamic derivations H. applies the equation $\log L = a + b \log \gamma$ to the data for C_6H_6, H_2O, C_2H_5OH, where L is the heat of evapn. and γ the surface tension. The agreement is excellent. A. E. Ruark

A relation between the capillary constant and the heat of evaporation; the association of liquids. Nikolaus von Kolosovski. *Z. anorg. allgem. Chem.* **155,** 351–4 (1926).—From thermodynamics and from Trouton's rule K. shows that $\rho = 18\ a^2$ where ρ is the heat of evapn. and a the capillary const. of Poisson. This relation is applied to a no. of assocd. and unassocd. liquids. It gives us a means of studying assocn. since it may be expected to hold only for unassocd. liquids. A. E. Ruark

Thermal dissociation of the ammoniates of silver nitrate. Franz Jirsa and Josef Diamant. *Z. physik. Chem.* **123,** 261–74(1926); cf. *Compt. rend.* **118,** 1149(1894).—$AgNO_3$ with dry NH_3 forms $AgNO_3.3NH_3$, which dissociates reversibly into NH_3 and $AgNO_3.2NH_3$. The NH_3 tensions at various temps. were 13.4°, 60.85 mm.; 20.1°, 87.7; 30°, 150.2; 40°, 259 3; 63° 760; 70° 1001.1; 80°, 1441. These agree well with those calcd. by van't Hoff's formula, $\log (p_2/p_1) = -(Q/4.571)[(1/T_1) - (1/T_2)]$, where Q = 9551.1 cal. Q by indirect calorimetric measurements is 8741 cal. The vapor tension for dissocn. of $AgNO_3.2NH_3$ to $AgNO_3$ could not be measured because it is not readily reversible, and the 2 solid phases form solid solns. The heat of dissocn. by 2 different calorimetric methods is 17,422 and 17,235 cal. The non-existence of $AgNO_3.NH_3$ was demonstrated. A. W. Francis

Thermochemical investigations and gas reactions. I. The heat of formation and conditions for existence of carbon tetrachloride. Max Bodenstein, Paul Günther and F. Hoffmeister. *Z. angew. Chem.* **39,** 875–80(1926).—The heat of the reaction CCl_4 (g) + $2H_2$ = C + 4HCl (set off by exploding $H_2 + Cl_2$ mixt. with silver oxide) was 62,570 ± 350 cal. at 20°. The heat of formation of CCl_4 (g) is 25.430 ± 350. Calcn. by Nernst's theorem leads to an equil. const. of 0.2 at 600° K. Practically therefore CCl_4 cannot be made above that temp. by direct synthesis and with the present catalysts the reaction is very slow below it. F. R. B.

Specific heat of the hydrogen molecule. A. Predvoditelev. *Z. Physik* **34,** 178–83(1925).—A formula is obtained by considering the H mol. as a rotating dipole, without introducing quantum theory, and is in satisfactory agreement with expt., particularly for low temps. A relationship is deduced between the energy of rotation and the b. p. B. C. A.

The specific heat of ferromagnetic substances. W. Sucksmith and H. H. Potter. *Proc. Roy. Soc.* (London) **112,** 157–76(1926).—The Nernst-Eucken method of measuring sp. heats has been extended up to 410°. The sp. heats of Ni and of Heusler alloy have thus been measured up to temps. considerably above their crit. points without finding discontinuities. Magnetic measurements were obtained simultaneously. Heat treatment of the alloy considerably reduced the satn. intensity of magnetization without correspondingly decreasing the sp. heat. Evidence is presented to show that these effects are not due to impurity or uneven temp. The results, however, are not in agreement with the Weiss theory of sp. heats of ferromagnetic substances. A. W. K.

Theory of the specific heat of electrolytes. F. Zwicky. *Physik. Z.* **26,** 664–5 (1925); *Proc. Nat. Acad. Sci.* **12,** 86–92(1926).—The heat capacity of solns. of electrolytes may be divided into terms C_0 the heat capacity of the pure solvent, C_1 the heat capacity according to classical theory obtained by counting the no. of particles. These two terms give the entire expression for non-electrolytes. Then there are other terms: C_5 involving the Debye ion atm. which is negligible; C_2 the energy necessary to discharge the ions at const. hydration and const. internal pressure (this term contributes —10 cal. per mol. dissolved substance); C_3 the effect of changing the internal pressure of the water due to the force of the charged particles on the water bipoles (this term in dil. soln. may be —119 cal.), and C_4 the energy of hydration which cannot be calcd. Neglecting it gives results in agreement with expt. as far as magnitude and law is concerned. F. R. Bichowsky

A study of the specific heat of homogeneous phases, involving water. G. F. Hüttig and Hermann Wehling. *Kolloidchem. Beihefte* **23,** 354–67.—Water may be held (*a*) chemically, (*b*) by both chem. and osmotic forces, (*c*) purely osmotically, (*d*) by capillarity, (*e*) by adsorption and mechanically. A knowledge of the sp. heats of such systems is necessary for an application of the 3rd law of thermodynamics to det. the

difference between "fixed" and "vagabond" water. Sp. heats were detd. for the systems $LiBr-H_2O$, $C_{12}H_{22}O_{11}-H_2O$ and ZrO_2-H_2O. A detailed description is given of calorimeter and technic for the detn. of sp. heat of solns. R. W. RYAN

Thermal cleavage of methane by incandescent wire. GEORG-MARIA SCHWAB AND ERICH PIETSCH. *Z. Elektrochem.* **32,** 430–4(1926); cf. *C. A.* **20,** 2933.—The heat of activation 55 cal. as measured from CH_4 cleavage expts. is insufficient to cause complete decompn. of CH_4 into atomic C and H. For the latter reaction 330 cal. is required, for C_{sol} + 4H 180 cal., for $C_{at.}$ + $2H_2$ 170 cal. The only possible reaction is $CH_4 = C_{sol} + 2H_2$; intermediary stages of lower energy content than $C_{at.}$ and $H_{at.}$ have to be assumed, *i. e.*, adsorption of the elements on the Pt filament with energy loss. The catalyzing action of the Pt surface consists not only of an increase in collision frequency but also in lowering of the energy threshold. Preliminary expts. with application of an elec. field between a Pt net anode and the filament showed that above 15–16 v. (360 cal) additional cleavage due to electron impact becomes noticeable; this energy step corresponds to the above mentioned value for complete atomic decompn. of the methane. B. J. C. VAN DER HOEVEN

Free energy and heat of transfer of barium in its liquid amalgams. P. A. ANDERSON. *J. Am. Chem. Soc.* **48,** 2285–95(1926).—The e. m. f. of liquid Ba amalgam concn. cells, with a soln. of $BaCl_2$ in anhydrous hydrazine as electrolyte, is const and reproducible to within 0.01 mv. 23 cells were measured at 25° over the concn range 0 2626%, slightly below satn., to 0.0108% of Ba by wt. 3 cells have also been measured at 15° and 35°. The observed potentials are markedly higher than the values calcd. by the concn. law. The data are extrapolated to infinite diln and the activities, free energies and heats of transfer of Ba are calcd The temp. coeff. of e m. f. is apparently a function of the temp. and d^2E/dT^2 positive. The data are applied to test the Cady equation. R. H. LOMBARD

The free energy of hydration of ions and the electrostriction of the solvent. T. J. WEBB. *J. Am. Chem. Soc.* **48,** 2589–603(1926).—The difference between the energy in the water surrounding an ion due to its charge and the energy of an equiv. vol when the ion is in a vacuum is the elec. part of the free energy of hydration. In addn., energy is required to compress the solvent adjacent to the ion on account of the attraction for solvent mols. by the ion. These energies are evaluated by mathematical physical considerations and the free energy of hydration is calcd. as a function of the radius of the cavity surrounding the ion. In order to assign radii to actual ions the partial molal vol. of an ion of infinite diln. is calcd. as a function of its radius and the equations are solved for the radii and free energies of hydration of individual ions. The electron affinities of the halogens are calcd. and also the lattice energies of salts for which activity coeffs. are known in their satd. solns. E. R. SMITH

The free energy of formation of zinc oxide. C. G. MAIER, G. S. PARKS AND C. T. ANDERSON. *J. Am. Chem Soc.* **48,** 2564–76(1926); cf. *C. A.* **20,** 1021, 1157.- From e. m. f. measurements on cells of the type H_2 | dil. $Ba(OH)_2$ | ZnO + Zn the free energy change of the reaction ZnO + H_2(1 atm.) = H_2O(1) + Zn at 25° is 19,370 cal. Taking —56,560 for the free energy of liquid water, the free energy of formation of ZnO from electrolytic Zn is —75,930 cal and the heat of formation of ZnO is —82,600 by the Gibbs-Helmholtz equation integrated by assuming ΔH const. between 25° and 45°. From these values the entropy of ZnO is calcd. as 1146 cal. per degree but if ΔH_{298} = —83,037 as recalcd. from thermal data S_{298} = 10.01 Somewhat unsatisfactory results with $Zn(OH)_2$ cells give ΔF_{298} = 19,100 for the reaction $Zn(OH)_2 + H_2 = Zn + 2H_2O$, for the formation of $Zn(OH)_2$, ΔF_{298} = —132,220 and for the reaction ZnO + H_2O = $Zn(OH)_2$, ΔF_{298} = 240 cal. An aneroid calorimeter was used to measure the heat capacity of ZnO and its entropy was calcd. to be 10.4 cal. per degree from the smoothed curve. From this value and the recalcd. thermal value for ΔH, ΔF_{298} = —76,037 cal. for ZnO. Comparison of the results by these 2 methods with values calcd. from high temp. equil. and soly. lead to the following *best* values for 1 mol. of ZnO at 25:ΔH = —83,000 ± 300 cal., ΔF = —75,930 ± 150 cal. and S = 10.2 ± 0.2 cal. per degree. No evidence was found for the existence of solid solns. of Zn in ZnO or for allotropic modifications of ZnO. E. R. SMITH

A new statistical definition of entropy. MAX PLANCK. *Z. Physik* **35,** 155–69 (1926); cf. *C. A.* **20,** 696. E. R. BICHOWSKY

Individual thermodynamic behaviors of ions in concentrated solutions, including a discussion of the thermodynamic method of computing liquid-junction potentials. H. S. HARNED. *J. Phys. Chem.* **30,** 433–56(1926).—Measurements of cells of the types H_2 | HCl(m_0) MCl (m) | KCl (satd.) Hg_2Cl_2 | Hg and H_2 | MOH(m_0)MCl (m) | KCl (satd.) | Hg_2Cl_2 | Hg where M = Na, K, Li, have been reversed, completed, tabulated and dis-

cussed on the basis of the hypothesis of independent activity coeffs. of ions. The thermodynamic connection between individual ion activities and potentials at liquid junctions is pointed out and liquid potentials calcd. by a new thermodynamic method, in general agreement with expt. The expts. are in approx. though not exact agreement with the theory of Debye and Hückel. F. R. B.

Speed of reaction and thermodynamics. E. JOUGUET. *Ann. phys.* **5,** 5-72, 470-4(1926).—Thermodynamic potential divided by chem. resistance is assumed to equal speed of a chem. process. The formula for chem. resistance may be derived from analogy or working backwards from Marcellin's equation. Assuming the resistance, M.'s equation can be generalized to apply to speed of evapn., of allotropic transformation and photochem. reactions. Chem. potential is more carefully defined. F. R. BICHOWSKY

The degenerate gas and the properties of liquid at low temperatures. A. SCHIDLOF. *Arch. sci. phys. nat.* **8,** 5-22(1926).—Using Boses' statistics, S. derives the equipartition law, entropy equation and the equation of state of a monatomic gas. He predicts a max. d. of liquid He at 2.9° K.; exptl. value 2-3° K. F. R. BICHOWSKY

The thermodynamic treatment of the occurrence of miscibility gaps and compounds in solid solutions of binary systems. H. BREDEMEIER. *Z. anorg. allgem. Chem.* **154,** 405-12(1926).—The continuous series of mixed crystals, the miscibility gap in the solid state and the compd. formation in solid soln. are treated thermodynamically. PER K. FRÖLICH

A simple derivation of the Planck-Einstein formula. MASAO KATAYOMA. *Bull. Chem. Soc. Japan* **1,** 3-5(1926).—The oscillators of Planck with different energy are treated as different chem. substances in perfect soln. By applying thermodynamics and the law of perfect solns. and the quantum assumption the Planck-Einstein law is derived directly. F. R. BICHOWSKY

The thermodynamics and statistics of the quantum process (note on the question of the intensity of spectral lines). WALTER HEITLER. *Z. Physik* **36,** 101-20(1926).—The mass law is applied to radiation equilibrium. Radiation is treated as if it were a definite chem. substance. In regions where the Wien law holds, *i. e.*, where the radiation is dil., d. of radiation is treated as a concn. In "concd. radiation" (*e. g.*, in the Planck region) d. depends on the "active" phase d. Using the same conception in a statistical treatment of the Bose type, H. shows that the intensity of lines in series with the same head should follow the same law. The rule of the intensity of the sums of multiplets also follows. F. R. BICHOWSKY

The energy states of an ideal monatomic gas. ERWIN SCHRÖDINGER. *Sitzb. preuss. Akad. Wiss.* **1926,** 23-36.—Einstein pointed out that Planck's suggestion (*C. A.* **19,** 1656) fixes the total no. of statistical states per phase space. With this in view it is possible to calc. the entropy of a degraded gas either on the assumption of that zero energy is to be counted, or not counted. The two equations can be distinguished at very low temps. but this and all other treatments of the problem omit consideration of the van der Waals forces which must be the major factor at these temps. F. R. B.

The mercury-steam cycle. P. M. SHEN. *Power* **64,** 8-11(1926).—The relation of temp. to satn. pressure for the substances, CO_2, NH_3, SO_2, H_2O and Hg is shown. Ideal characteristics for power generation are possessed by steam in the low-temp. range and by Hg in the range above 400° F. The thermodynamic advantages of using mercury and steam in a binary system are described. D. B. DILL

Dielectric constant of diatomic di-pole gases on the new quantum mechanics. R. DEL. KRONIG. *Proc. Nat. Acad. Sci.* **12,** 488-93(1926).—Mathematical. K. with the help of Heisenberg's quantum mechanics, has derived the equation $(3/4\pi)[(\epsilon - 1)/(\epsilon + 2)] = (N\mu^2/3kT)[1 - (h^2/24\pi^2 IkT)]$, where ϵ is the dielec. const., N the no. of mols. per cc., I the moment of inertia of the dipole, μ the elec. moment. G. G. S.

Remarks on the work of J. W. Williams and I. Krchma (dielectric constants of binary mixtures). P. WALDEN, H. ULICH AND O. WERNER. *Z. physik. Chem.* **123,** 315-20(1926); cf. *C. A.* **20,** 2781.—Allowing for temp. coeff. the dielec. consts. of W. and K. for PhCl, 5.61 and for PhBr, 5.397 at 25° agree well with those of W., U. and W., 5.65 and 5.47 at 13° (cf. *C. A.* **19,** 3058). A. W. FRANCIS

Application of relativity to atomic and molecular systems. TH. DE DONDER. *Compt. rend.* **182,** 1380-2(1926).—Following a method using electromagnetic potentials and reducing the distributed charge to points, D. obtains equations of motion of the canonical form. Quantum conditions are applied directly. F. R. B.

Oxidation potentials in liquid ammonia involving quaternary ammonium radicals and alkali metals. GEO. S. FORBES AND C. E. NORTON. *J. Am. Chem. Soc.* **48,** 2278-85 (1926).—The oxidation potentials were measured of 10 quaternary NH_4 radicals in

equil. with their ions and electrons on Pt against Ag electrodes in satd. $AgNO_3$ soln., all in liquid NH_3 at its triple point. Comparisons with the alkali metals were also made. The concns. of free radicals were detd. in terms of Ag, after reaction with AgI. The concns. of the corresponding halides in satd. soln. at —78° were also detd. The analytical errors were of the order of 10%. The observed oxidation potentials of the radicals, also of Li, Na and K, all lie within 25 millivolts of one another. This outcome upholds the analogy between the 5th valence of N and that of an alkali metal. Data necessary to reduce all results to a compatible concn. basis are not available, but probably the corrections should be in millivolts rather than in centivolts. The small differences in oxidation potentials, if conditioned by chem. compn., are not readily correlated with the latter. R. H. Lombard

New views of the electrochemical oxidation of organic substances. Fr. Fichter. *J. chim. phys.* **23**, 481-500(1926).—Reactions taking place at a smooth Pt anode involving increase of O content or decrease in H content are discussed from chem. and electrochem. viewpoints. F. arrives at the conclusion that these oxidations of org. substances can better be explained by pure chemistry than by the modern electrochem. conception of discharging ions. Evidence is given to prove that anodic O liberated at a Pt anode is one of the most powerful of oxidants, exceeded in strength only by F. In fact so vigorous is its action that a great part of the ingredients is destroyed except in such cases that great insoly. of one of the products renders it a relative immunity. In support of his claim that electrochem. oxidation is similar to that of oxidizing agents, F. compared the 2 methods in the oxidation of toluene, the isomeric xylenes, phenol, ethers and many other compds. The opinion is advanced that electrochem. oxidation surpasses in possibilities the methods of pure chemistry although it destroys a great part of the products. That inorg. electrochem. oxidations, such as the anodic formation of persulfates and tervalent Co salts, are similar to chem. reactions is evidenced by duplication of these oxidations by gaseous F. The synthesis of Kolbe and the formation and decompn. of peroxides are discussed and the relation of electrochem. reactions to those which are purely chem. is further brought out. W. J. Sweeney

The measurement of the permeability and hysteresis of ferromagnetic substances at high frequency. The fundamental equations for ferromagnetic substances. W. Jaeger and W. Meissner. *Z. Physik* **36**, 161-4(1926).—A method based on a generalization of the Maxwell equation is proposed for measuring the permeability and hysteresis of ferromagnetic substances. F. R. Bichowsky

Light scattering due to molecular roughness of the surface between two transparent media. Richard Gans. *Ann. Physik* **79**, 204-26(1926).—The surface of a liquid is roughened by mol. motion. This roughness scatters light, as any rough surface would. The amt. of this is calcd. from electromagnetic and kinetic considerations. The scattering goes up rapidly near the crit. point and is very slight for liquid H_2O and H at room temps. F. R. B.

Theory of optically active isotropic media. V. Bursian and A. Timorev. *Z. Physik* **38**, 475-84(1926).—It is shown by mathematical analysis that the electron theory of natural optical activity of isotropic substances developed by Born (cf. *C. A.* **13**, 1560) requires amplification. In addn. to periodic elec. polarization considered by Born, a factor of the same order of magnitude in effect on the numerical value of the rotation is the mean periodic magnetic moment. An important consequence of B. and T.'s correction is that Voigt's criterion (cf. *Wied. Ann.* **56**, 307(1899)) that the Maxwell equations and the results derived therefrom must not conflict with the energy principle is for the first time satisfied. Albert P. Sachs

Double refraction of natural cellulose and chitin fibers. A. Möhring. *Kolloidchem. Beihefte* **23**, 162-88(1926).—The departure of the curve of diffraction gratings for anisotropic components of a mixed substance from that for isotropic components is so small that it can be neglected for the interpretation of the phenomenon of double refraction of coördinated substances. The double refraction of the cellulose fibers results from a strong pos. sp. refraction and refraction of rod-shaped particles. The chitin of the lobster shell has a neg. sp. refraction. Merrill Fenske

Gels with anomalous accidental double refraction. A. Möhring. *Kolloidchem. Beihefte* **23**, 152-61(1926).—H. Ambronn (*Ber. deut. botan. Ges.* **7**, 1899) explained the anomalous behavior of cherry gum as due to micelle growth of a cryst. nature in the gel. Celluloid, cellulose acetate and soap also show anomalous double refractions. Gelatin and *p*-cresol, forming cresol gelatin, is analogous optically to cherry gum. In all known cases of double refraction by gels, the anomaly depends on the orientation of the anisotropic parts. Merrill Fenske

Double refraction expressions in adsorption. Otto Weiner. *Kolloidchem.*

Beihefte **23,** 189–98(1926).—Formulas are given for the case of 2 isotropic components with examples, and for the isotropic change of absorbing substances. **Does the failure of the Röntgen interpretation of crystal structure preclude the existence of pure double refraction?** *Ibid* 198–200.—A substance may manifest double refraction without its being established by the Röntgen diffraction. Double refraction, as with small thin plates, may then not be ascribed to the form of the double refracting component. It is concluded that failure of the Röntgen interpretation does not preclude the existence of real double refraction. • MERRILL FENSKE

The spectrophotometric examination of dyes and indicators. I. Theory and instruments. E. B. R. PRIDEAUX. *Chemistry and Industry* **45,** 664–8(1926). **II. Types of absorption curves, determination of p_H and recognition of dyes.** E. B. R. PRIDEAUX. *Chemistry and Industry* **45,** 678–81, 697–9(1926).—General considerations and information regarding the procedure are given. The detn. of p_H by absorption coeffs. is discussed and described in detail and absorption curves are given for a number of indicators. The effect of substitution on absorption curves and the absorption of dyestuffs under different conditions are also taken up and illustrated by graphs.
E. G. R. ARDAGH

A method of colorimetry. J. GUILD. *Trans. Opt. Soc.* (London) **27,** 139–58 (1925–6). D. E. SHARP

A criticism of the monochromatic-plus-white method of colorimetry. J. GUILD. *Trans. Opt. Soc.* (London) **27,** 130–8(1925–6). D. E. SHARP

A study of the mathematics of colorimetry by means of a general formula. ROBT. F. MCCRACKAN. *J. Chem. Education* **3,** 928–31(1926). E. J. C.

Structure of tiemannite and coloratrite (JONG) **8.** Structure of olivine (BRAGG, BROWN) **8.** X-ray contributions to the analysis of the structure of rubber and allied materials (CLARK) **30.**

ECKERMANN, HARRY VON: **Molecular Proportions.** Uppsala: Almquist & Wilksells Botryckeri-A.-B. 219 pp. 1925. Reviewed in *Mineralog. Abstracts* **3,** 65.

3—SUBATOMIC PHENOMENA AND RADIOCHEMISTRY

S. C. LIND

X-rays—Internal absorption and "spark" lines. H. ROBINSON. *Nature* **118,** 224(1926). W. F. MEGGERS

Researches on the element with atomic number 61. I. LUIGI ROLLA AND LORENZO FERNANDES. *Gazz. chim. ital.* **56,** 435–6(1926).—The search for element no. 61, the discovery of which has recently been in dispute (cf. Hadding, *C. A.* **16,** 4133; Günther and Stranski, *C. A.* **18,** 602; Prandtl and Grimm, *C. A.* **18,** 2983) was first undertaken by R. and F. in 1922 with a small quantity of mineral contg. didymium from Brazilian monazitic sand. The x-ray emission spectrum (L series) gave negative results, but the absorption spectrum showed the characteristic lines of element no. 61. The expts. were later continued with larger quantities of mineral, the double sulfate method of sepn. (*C. A.* **19,** 220, 221) being rendered more suitable by crystn. of the mixed crystals of the double nitrates of the didymium earths and Tl with the nitrates of the earths with NH_4. The uncrystallizable residues were transformed to double nitrates with Mg. After 3000 crystns. there were obtained residues rich in Sn which showed anomalies in the absorption spectrum (K series), indicating the presence of element no. 61. During completion of the expts. the contemporary work of Harris, Hopkins and Yntema (*C. A.* **20,** 2600) appeared, thus rendering certain the existence of element no. 61 (Il).
C. C. DAVIS

The theory of polarization of independent x-rays. RITA BRUNETTI. *Atti accad. Lincei* [6] **4,** 43–8(1926).—Mathematical. It is shown that the polarization of x-rays is a max. at the limit of the continuous spectrum and that it decreases progressively with increase in the wave length, thus confirming results already obtained experimentally by Kirkpatrick (*Phys. Rev.* **22,** 226(1923)). The polarization for a given radiation decreases with increase in the potential (cf. Kirkpatrick, *loc. cit.*), so that the degree of polarization depends upon the velocity of the electrons which generate it.
C. C. DAVIS

Quantum principles and line spectra. J. H. VAN VLECK. *Bull Natl. Research Couucil* **10,** Pt. 4, No. 54, 316 pp.(1926).—A monograph. E. J. C.

Rubidium- and cesium-like doublets of stripped atoms. R. C. GIBBS AND H. E. WHITE. *Proc. Nat. Acad. Sci.* **12,** 551-5(1926).—As in a previous paper (*C. A.* **20,** 2949) it has been possible to apply the regular and irregular doublet laws to elements in the same rows with Rb and Cs. Frequencies of the $5s$-$5p_2$ and $6s$-$6p_2$ lines progress almost linearly with the at. no. as the core charge increases. The screening consts. of the alkali metals from Li to Cs show regular progression. W. ALBERT NOYES, JR.

The fine structure of certain lines and energy levels of cadmium. W. A. MACNAIR. *Proc. Nat. Acad. Sci.* **12,** 555-6(1926). W. F. MEGGERS

The arc spectrum of nickel. K. BECHERT AND L. A. SOMMER. *Sitz. math. naturw. Abt bayer. Akad. Wiss. München* **1925,** 9-13; cf. *C. A.* **19,** 3427; **20,** 14. W. F. M.

Spectral regularities of atoms in the iron series. M. A. CATALÁN. *Sitz. math. naturw. Abt. bayer. Akad. Wiss. München* **1925,** 15-22. W. F. MEGGERS

The Bohr theory and ionization potentials. L. ROLLA. *Anales soc. españ. fís. quím.* **24,** 101-16(1926).—An address to the II National Chem. Congress, Palmero, May, 1926. E. M. SYMMES

A difficulty with the theory of circular electrons. GREGOR WENTZEL. *Z. Physik* **37,** 911-4(1926).—The detn. of the Rontgen doublets through the development of the theory of circular electrons showed discrepancies which were not reconcilable by either the Heisenberg or classical quantum mechanics MERRILL FENSKE

A new method for determination of the effective cross-section toward slow electrons. MARTIN RUSCH. *Ann. Physik* **80,** 707-27(1926); cf. Ramsauer, *C. A.* **17,** 2990; Busch, *C. A.* **17,** 924 —A metal cylinder with two narrow openings in the center of the end planes is surrounded by a coil establishing a longitudinal field. Electrons entering the pinhole B_1 at one side of the cylinder from an incandescent filament placed before it, will follow spiral orbits inside the cylinder; those of equal longitudinal velocity v come together at a distance l from B_1 on the axis and can leave it through pinhole B_2, the condition being that $eH/m = 2\pi v \cos \vartheta/l$ if ϑ is the divergence angle of the initial path from the cylinder axis. A certain region of angles ϑ is selected by a diaphragm in the center of the cylinder leaving a ring open between radii ρ_1 and ρ_2 ($tg\vartheta$ between $\pi\rho_1/l$ and $\pi\rho_2/l$). Possibilities for electrons of higher order (describing more than one spiral turn) are negligible. For detn of the effective cross-section the monochromator is followed by a similar two-hole cylinder (without diaphragm) in the same axis and a third one of shorter length, all in the magnetic field. The last two cylinders are to be considered as Faraday cages. By measuring the electrons emerging from the monochromator I_1 and I_2, simultaneously with those coming through the second cylinder i_1 and i_2 (by electrometer measurement) the effective cross-section for corresponding gas pressures p_1 and p_2 will follow from $i_2/I_2 = i_1/I_1e^{-\alpha_0(p_2-p_1)L}$ if L is the length of the orbit of the electrons in the second cylinder. In the app. used the diam of the pinholes was 0 4 mm (exchangeable), the first two cylinders were 1×2 cm., the last 1×1 cm , $L = 30.8$ mm. The entire arrangement was enclosed in a glass tube and could be kept at any desired (argon) vacuum; the electron speed of the monochromator was varied by magnetic field H variations. Whereas evidently $i_1 = I_1$ *in vacuo*, a best value of $i/I = 0.80$ could only be obtained, the discrepancy being due to inexact centration of the app. in the combined terrestrial and artificial magnetic fields (cf also Ramsauer, *Ann. Physik* **64,** 531(1921)). For the longitudinal effective cross-section of argon (log i_1I_2/i_2I_1 was found exactly proportional to the pressure) was found $\alpha_0 = 38.7$, 53 5, 71.1, 40.4 (23.9) per cm. for 1 mm. Hg pressure, electron velocities in v. 29.1, 19.2, 12.4, 7.2 and 3.5, resp. B. J. C. VAN DER HOEVEN

The constitution of the stars. KERR GRANT. *Nature* **118,** 373-4(1926).—The assumption that d., av. mol. wt. and other contingent properties of stellar material vary in a *continuous* manner from the star's surface to its center is questionable. G. suggests that the central portion of a luminous star consists of stripped atoms and electrons (or protons and electrons in its early life) surrounded by successive shells of atoms in various degrees of association. J. E. SNYDER

The periodical effects of thin films from the standpoint of the limiting problem of electromagnetic theory. FR. HLUCKA. *Z. Physik* **38,** 589-99(1926).—The periodical phenomena of the optical photoelec. and photochem. behavior of thin absorbing, nonmetallic films follows directly from the limiting conditions of the electromagnetic theory of light. F. O. A.

The relation between the temperature and the energy of a gas. E. WERTHEIMER. *Z. Physik* **38,** 675-705(1926); cf. *C. A.* **19,** 3056.—A thermodynamic and electromagnetical study of the relation between the temp. and the various energies associated with a gas. The essential idea is that if the gas is in a "Hohlraum" an equation can be

obtained connecting the av. energy of a gas mol. and the radiation density, whence a relation of the av. energy with the temp. can be obtained by Planck's law. A. E. R.

The quantum theory of tri- and polyatomic molecules. F. Lutgemeier. *Z. Physik* **38,** 251–63(1926).—The energy levels of polyatomic mols. are calcd. on the basis of the old rules of quantization (Sommerfeld's phase integral rule for systems whose coördinates are separable). The model used is a rigid body whose 3 principal moments of inertia are different. Oscillations of the atoms and deformation by centrifugal forces are therefore neglected. L. obtains 2 formulas for the energy levels; one is valid when the energy is greater than the square of the angular momentum, divided by $2B$, where B is the moment of inertia whose value lies between those of the other 2 moments; the other formula is valid when the energy is smaller than this quantity. The theory predicts that the spectrum of a triatomic mol. whose atoms lie nearly in a straight line will differ only slightly from that of a diatomic mol.; but for "bent" mols. there will be bands such that the first formula will be valid for the initial state and the second for the final state. Arthur E. Ruark

Some properties of Compton radiation. Hartmut Kallmann and Hermann Mark. *Z. Physik* **36,** 120–43(1926); cf. *C. A.* **20,** 705.—Compton radiation is polarized according to the classical formula for scattered radiation. The radiation is incoherent. At angles over 90° the intensity increases. F. R. Bichowsky

Theory of light emission according to the model of Rutherford-Bohr. J. Palacios. *Ann. Physik* **79,** 55–80(1926).—Planck's const is the product of a const. times 1.4×10^{-8} sec. and a const energy 4.7×10^{-19} erg. The first of these is the time of emission of a quantum. The theory of Part I (*C. A.* **19,** 3212) is extended to cover the scattering of canal rays, and their intensity in agreement with observations and theory of Wien. F. R. Bichowsky

The length of light emission of atoms. Rate of decrease of the alkalies and hydrogen emission in a magnetic field. E. Rupp. *Ann. Physik* **80,** 524–32(1925).—By Wien's method the emission life of K 404 mμ and Li 460, 427, 413 mμ are resp. 2.9, 5.2, 5.2, 5.2×10^{-8} sec. The canal rays of the alkalies were obtained by bombarding salts with electrons. Magnetic fields of 12000 gauss were without effect on the life of these atoms. F. R. Bichowsky

Inertia and ether. O. Foppl. *Z. Physik* **33,** 273–80(1925).—Ether is considered to possess zero elastic const. but a deformation const. and mass. F. R. B.

A limit for the duration of the emission process in canal rays in hydrogen determined by passing them from an electric field into a field-free space. B. M. Bloch. *Z. Physik* **35,** 894–904(1926).—If the actual time of emission is finite, atoms passing from a region of strong elec field into a field-free space should show a Stack effect which should persist into the field-free region. Trying this expt. with H_2 canal rays showed no persistance though if the process of emission took 10^{-10} sec. it should have been detected. F. R. Bichowsky

The three-dimensional reproduction of tracks of β-particles ejected by x-rays. Orrell Darbyshire. *Nature* **118,** 371–2(1926).—With a horizontal primary x-ray pencil the most suitable directions of the lens-axes, using sep. single lens cameras, are the horizontal and vertical perpendiculars to the pencil. Illumination is obtained by use of a right-angled glass prism placed in the base of the cloud chamber so that a total internal reflection of the illuminating beam is produced in a direction bisecting the angle between the axes of the cameras. J. E. Snyder

Radium, uranium and vanadium. F. L. Hess. *Mineral Ind.* **43,** 625–33(1925).—Sources, production and technology are discussed. A. B.

Experiments on the electrolysis of radium D and radium E. John P. McHutchison. *J. Phys. Chem.* **30,** 1112–5(1926); cf. *C. A.* **20,** 2784.—Ra D and Ra E have been extd. on ordinary Pt electrodes from HNO_3 soln. with the electrolytic conditions required for the extn. of their respective isotopes Pb and Bi. The extn. is possible if traces of Pb or Bi are present; but the active matter on any one electrode is due to adsorption as well as to electrolytic deposition. Harry B. Weiser

Study by the absorption method of the primary and secondary radiation due to radium. (Mme.) J.-S. Lattès. *Ann. phys.* **6,** 102–82(1926); cf. *C. A.* **20,** 1352.—The absorbability of different "principal groups" of radiations is detd. by special methods of sorting them out from the total complex radiation. A theoretical formula is developed to describe the formation of the secondary radiation, and this is tested by expt. There is found to be a continuous background of secondary β-radiation whose quantity depends on the substance emitting it, and whose quality depends only on the nature of the exciting γ-radiation. The β-radiation which is excited by the γ-rays of Ra and which has traversed a certain thickness of matter (1.8 g./sq. cm.) is identical whatever

the nature of the absorbing screen. Therapeutic data are included. It is found that in the use of Ra most of the necrosis is due to corpuscular radiation. Certain specific directions and tables are given concerning the best types of absorbing filters to use in various types of therapy. Other results included have already been reported (*l. c.*). Full exptl. details are included. NORRIS F. HALL

Researches on the radioactive springs of Puy-de-Dôme. CH. JACQUET. *Compt. rend.* **183,** 227–9(1926); cf. *C. A.* **20,** 2944.—The radioactivity of the geological formations through which the water flows is compared with that of the water. In general there is an agreement. L. D. ROBERTS

The retardation of alpha rays by material. S. ROSENBLUM. *Compt. rend.* **183,** 198–200(1926).—The method used for measuring the retardation consisted in measuring the magnetic deviation and receiving the rays on a photographic plate. The source of radiation was the active deposit of Th. The effect of mica, Al, Cu, Ag, Sn, Au, Pt and Pb was detd. L. D. R.

Contribution to the study of the chemistry of polonium. J. ESCHER-DESRIVIERES. *Ann. chim.* **5,** 251–313(1926).—Historical, theoretical and exptl. account of Po in connection with other radioactive elements is given. The author's expts. are described. L. D. R.

Study of some chemical reactions produced by β- and γ-rays of radium on substances in the vapor state. JACQUES ERRERA AND VICTOR HENRI. *J. phys. radium* **7,** 225–9(1926).—The action of the rays on the following are given: C_6H_6, C_6H_6 in the presence of Pt, C_6H_5Cl, $C_6H_5Cl + H_2$, $C_6H_6 + H_2$, $C_6H_6 + H_2$ + Pt, $C_6H_5Cl + H_2$ + Pt, C_6H_6 + air, $N_2 + O_2$, $C_6H_5NO_2$. In the case C_6H_5Cl there is probably a polymerization of the mol. In a mixt. of C_6H_6 and air or O_2 phenol is formed. Three plates of absorption spectra are shown. L. D. ROBERTS

Special action of the sun on the radioactivity of polonium and lead. MLLE. ST. MARACINEANU. *Compt. rend.* **183,** 345–7(1926); cf. *C. A.* **19,** 1812.—If a drop of Po soln. is dried in the sun the ionization current obtained through a Pb plate is very much increased over that obtained when the Po was not exposed to the sun's rays L. D R.

A new type of electron spectrograph. KENNETH COLE. *Science* **63,** 575(1926).—The app. includes a Hull magnetron acting as a slit parallel to an oxide-coated filament mounted on the axis of a cylindrical anode. The whole is placed in a magnetic field. Electrons with velocities of 30 v. or less are photographically effective. Photographic plates treated with a thin film of fluorescent oil are 40 to 50 times more sensitive to low-velocity electrons. G. L. CLARK

The apparent antagonism of short and long waves by internal photoelectric action. B. GUDDEN AND R. POHL. *Z. Physik* **37,** 881–8(1926).—The antagonism by photoelec. absorption in solid material does not depend on a difference of sp. activity of the various waves; all waves split off only electrons. The observed phenomena indicate the well-founded hypothesis that the elements of the space lattice undergo derangement dependent on the temp. by photoelectric splitting off of electrons, until an intermittent equalization follows. The derangement causes a widening of the spectrum to longer waves, which disappears when a limiting value is reached. MERRILL FENSKE

Mean free path of electrons in mercury vapor. L. R. MAXWELL. *Proc. Nat. Acad. Sci.* **12,** 509–14(1926).—The method is based on the equation $I = I_0e^{-x/\lambda}$. A movable Faraday cage measures the current I_0 and then at succeeding values of x, the currents I. At 3.12 bars and 75° the values at 1120, 2040 and 3050 v. were found to be 73, 123 and 144 cm., resp. G. G. SWARD

Temperature relations of photoelectric emission and thermionic emission of electrons. E. H. HALL. *Proc. Nat. Acad. Sci.* **12,** 486–8(1926).—The work accompanying the thermionic emission of an electron may be expressed as $c - (s - 2.5)RT$ ergs, where c and s are consts. This is shown not to be in conflict with Richardson's equations $i = AT^{1/2}\epsilon^{-b_0/T}$ and $i = cT^2\epsilon^{-d_0/T}$. G. G. SWARD

The question of the space-expanded electron in the general theory of relativity. V. FRÉEDERICKSZ AND A. ISAKSON. *Z. Physik* **38,** 788–802(1926).—A math. paper in which some suggestions of Einstein (*Sitzb. preuss. Akad.* **1919,** 349; cf. *C. A.* **13,** 192) are examd. W. ALBERT NOYES, JR.

The independence of the spark potential of the temperature. B. FREY. *Ann. Physik* **80,** 408–14(1926).—Measurements of the spark potential between 2 brass plates in dry air at various pressures and temps. show that the min. potential is independent of the temp. and that no shift of the min. occurs when account is taken of the density changes accompanying decreasing temp. The dependence of spark potential upon temp. found by Benton (*Phil. Mag.* [6] **1,** 219(1926)) is ascribed to humidity changes in the gas. W. F. MEGGERS

Cathode disintegration II. The derivation of laws of collision sputtering from experiments with silver in hydrogen. A. GÜNTHERSCHULZE. *Z. Physik* **38**, 575–88 (1926); cf. *C. A.* **20**, 2446.—The amt. of Ag disintegrated in H in a 1000-v. cathode drop between parallel electrodes and with suitable protection against the wall effect is proportional to the voltage directly, inversely to the electrode distance and inversely to the H pressure. The proportionality const. should depend upon the gas and the metal; for Ag in H it is 0.868. Results are given for 21 metals in H and in O. F. O. A.

The passage of high-frequency currents through a glow discharge. B. N. KLYARFELD. *Z. Physik* **38**, 289–303(1926).—The resistance of a glow discharge in A was measured by means of a weak high-frequency current superposed on the direct current which feeds the discharge. The values obtained depend on the frequency and intensity of the measuring current. Other things being equal the resistance of a discharge between plane electrodes varies inversely as the area of the part of the cathode which is covered with a luminous sheath. The phase lag between current and voltage is of the order of 29°. The observations are explained on the assumption that the discharge tends to resist changes in the area of the luminous sheath, and of time lags of changes in the ionization. A. E. RUARK

The dissociation of N_2 by electron collision. V. KONDRATIEV. *Z. Physik* **38**, 346–52(1926).—Lines of the neutral N atom first appear in a low-voltage arc run at very low N pressure when the potential is raised to 32 ± 2 v., proving that the elementary process involved is $N_2 \longrightarrow N' + N'$ or $N_2 \longrightarrow N' + N^+$. A. E. R.

The influence of adsorbed gas on the magnitude of the photoelectric effect. A. PREDVODITELEV AND G. JOFFE. *Z. Physik* **38**, 280–8(1926).—Comparative measurements of the magnitude of the photo current from coconut charcoal maintained at various temps. *in vacuo*. ARTHUR E. RUARK

Characteristics of the positive emission in a new metallic tube with a heated anode. MAX MORAND. *Compt. rend.* **181**, 544–5(1925). NORRIS F. HALL

Measurement of the mobility of ions in gases. MARCEL LAPORTE. *Compt. rend.* **183**, 119–21(1926); cf. *C. A.* **20**, 2279.—Curves representing the laws of distribution of ions of different mobilities are given. The distribution of the positive ions in air, O_2 and N_2 are similar. In case of negative ions the distributions in dry air and O_2 coincide, while the curve in dry N_2 is altogether different. The negative ions of air are ions of oxygen. Mobility in argon was investigated. L. D. ROBERTS

Photo-electric properties of thin films of alkali metal. II. Phenomena at high temperatures. H. E. IVES. *Astrophys. J.* **64**, 128–35(1926); cf. *C. A.* **20**, 1948.—A Pt ribbon in an atm. of Cs vapor is heated to various temps. up to incandescence by the passage of an elec. current. Keeping the vapor pressure of the Cs low by cooling the walls of the tube, thermionic currents and photo-elec. currents, caused by illuminating the ribbon, are obtained of the same order of magnitude, and their variation with temp. detd. Both thermionic and photo-elec. currents increase with temp. to a sharp max. and then decrease to negligible values. Consideration of the relative magnitudes of the 2 currents leads to the conclusion that the thermionically emitted electrons cannot be due to an internal photo-elec. excitation. MARIE FARNSWORTH

Photo-ionization experiment with hydrogen. F. L. MOHLER. *Proc. Nat. Acad. Sci.* **12**, 494–6(1926).—Photo-ionization expts. with H by a discharge in the same gas (*C. A.* **20**, 2947) produce no evidence that H emits radiation capable of ionizing the normal mol. This conclusion agrees with spectroscopic results, for no H lines have been identified beyond 885A. U. corresponding to 15 v. The relation of the results to the structure of the H_2 mols. is discussed. G. G. SWARD

The effect of divergence and convergence of the primary x-ray beam on the form and size of the spots in a Laue photograph. J. LEONHARDT. *Z. Krist.* **63**, 478–95 (1926).—It is shown mathematically and proved experimentally that there are 6 types of spots possible in Laue photographs, depending upon the character of the incident beam. The possibility of crystal aggregates showing pseudo-symmetry is discussed. L. S. R.

The absorption of x-rays in crystalline compounds. R. T. HAVIGHURST. *Proc. Natl. Acad. Sci.* **12**, 477–9(1926).—H. tests exptly. the Compton empirical formula expressing absorption in compds., $\mu/\rho = (C\lambda^3\Sigma N^4 + 0.32\Sigma N)/\Sigma A$, where μ/ρ is the mass abs. coeff., C a const., λ the wave length, N the at. no. summed up for the atoms in the compd. and A the at. wt. similarly summed. Satisfactory agreement is obtained, except for LiF (the formula is derived for at. nos. > 5), both with the formula and with Windgardh's measurements of the compds. in soln. GEORGE L. CLARK

The theory of x-ray scattering. II. OTTO HALPERN. *Z. Physik* **38**, 149–56 (1926); cf. *C. A.* **19**, 777.—A comparison of the validity of quantum-kinematic and light-

antum theory considerations, involving presentation of classical mech. analogies the Compton effect. G. L. Clark

The index of refraction of x-rays. W. Ehrenberg and H. Mark. *Z. Physik* , 129–36(1926).—The dependence of the n of x-rays upon frequency of the rays was ought exptly. with W L-rays and a Zn blende crystal. In the region of the characteristic absorption edge of Zn (1280.0 X. U.) anomalous results are obtained which are ot in agreement with Ewald's dispersion theory but suggest another dispersion law. G. L. Clark

The x-ray levels of the elements copper (29) to lanthanum (57). D. Coster and F. P. Mulder. *Z. Physik* **38**, 264–79(1926).—New measurements of the L absorption edges and L spectra of the elements Rb (37) to Cd (38) are recorded. These values together with previous measurements and with optical data make it possible to construct accurate tables for the ν/R and $\sqrt{\nu/R}$ values of the elements from Cu to La. The Moseley diagrams for the M, N and O levels show decreases of slope at those points in the periodic system where the Stoner scheme predicts that the last bound electron goes into an underlying shell, and increases of slope at points where the underlying shell is completed (Cf. Bohr and Coster, *C. A.* **17**, 1581) The technic of absorption measurements on light elements is discussed. Arthur E. Ruark

The position of the absorption band of a dissolved dye in various colorless solvents. Antonie Szilárd. *Biochem. Z.* **170**, 185–200(1926).—The expts. corroborate Kundt's rule according to which the absorption bands of a dye are displaced towards the red end of the spectrum with the increasing mol. refraction of the colorless solvents In the homologous series of normal alcohols with increasing mol refraction the absorption bands of a dissolved dye show greater displacement of the bands situated in the red than in the violet portion of the spectrum. A similar condition is observed within the homologous series of ethyl esters, though not in the same measure as in the alc series The absorption bands are unevenly displaced even in a series of isomeric alcs (normal, secondary and tertiary). Alcs. with straight and branched C-chains, provided they have the same number of C atoms, possess the same mol. refraction, but the absorption bands of a dye dissolved in these alcs. occupy different positions. The position of the absorption bands is practically the same when the solvents are isomeric esters of similar structure, but the difference increases when the esters are dissimilar in structure The displacement of absorption bands of a dye dissolved in the homologous benzene series is also towards the red end of the spectrum, but it is not as large as in the case of the homologous normal alcs. S. Morgulis

Series endings and molecular fields. F. Paschen. *Sitzb. preuss. Akad. Wiss.* **16**, 135–41(1926) --With gas pressures above 2 mm. the last lines of the arc spectrum series of He observed in the glow in the interior of a cylindrical cathode appear strengthened and widened, and a continuous spectrum extends beyond the series limit. The widening is the Stark effect ascribed to elec fields and since the line $2s - 3d$ which is especially sensitive to elec fields is not so strong in the negative glow as in the positive light, the elec. fields act only on high quantum orbits and are to be regarded as molecular. W. F. M

Zeeman effect in the palladium spectrum. Marie Levitskii. *Ann. Physik* **80**, 397–407(1926) —A Du-Bois electromagnet giving a field strength of 23,010 gausses was used to study the transverse magnetic effect on nearly 200 Pd lines from 2198 to 4553 A. U. Seven resolved complex patterns are measured; the remainder are more or less diffuse triplets and quadruplets W. F. Meggers

The arc spectrum of copper at reduced pressure. G. Wolfsohn. *Ann. Physik* **80**, 415–35(1926).—The arc spectrum of Cu between the wave length limits 2100–5200 A. U is measured with the arc operated at normal pressure and at a reduced pressure of 4 or 5 cm. Hg. The wave lengths of about 75 lines are accurately measured relative to secondary standards in the Fe arc and the pressure displacements are detd. for a considerable no. of lines. No simple relation of pressure shifts to spectral terms is found The known spectral regularities are tested with the improved wave-length data and the lines are divided into 4 classes according to their behavior in the vacuum arc as compared with the arc in air. W. F. Meggers

The characteristic vibration spectrum of diatomic molecules in wave mechanics. E. Fues. *Ann. Physik* **80**, 367–96(1926).—A translation of the motion of diatomic mols. in the language of the Schrödinger-wave-mechanics according to which the vibration process may be described by a wave equation in the q-space, closely related to the Hamiltonian function of point-mechanics. W. F. Meggers

Comparison of the red cadmium line in the vacuum arc and in the discharge tube. F. L. Brown. *J. Optical Soc. Am.* **13**, 183–92(1926).—The wave length of the red

radiation of Cd is compared interferometrically with Ne and Hg standards first when the source is a vacuum arc and second when it is a discharge tube. It is concluded that the 2 sources do not differ for the red line, 6438 A. U. by as much as 0.001 A. U.
W. F. M.

The spectrum of argon. F. A. SAUNDERS. *Proc. Nat. Acad. Sci.* **12,** 556–60 (1926).—Many new lines have been measured in the extreme ultra-violet to 848.71 A. U. and certain series can now be given with some assurance. As in Ne, four S levels, ten p levels and a host of subordinate series terms are found. The ionization potential is calcd. to be 15.69 v. as compared with 15.3 observed by Hertz. A second set of principal series like those in Ne converge to a limit some 1400 units higher than the normal ones and thus give an ionization potential of 15.86 v. W. F. MEGGERS

The x-ray absorption spectrum of argon. J. H. VAN DER TUUK. *Physica* **6,** 258–65(1926).—The fine structure of the K absorption edge (3.8647 A. U.) in A was studied and compared with that of Cl and K. It might be that simultaneous removal of a second K, an L or an M electron with the primary K caused appearance of secondary edges, the places of which were calcd. Measurements with an A pressure of 3 to 30 mm. Hg, gypsum crystal and 0.1-mm. spectrometer slit showed the complete absence of fine structure for the A K edge at the calcd. places. For chlorine (NH_4Cl) the distance between main edge and secondary edge was 22.8 X. U., *i. e.* 14.6 v ; for potassium 24 6 X. U. or 25.8 v. The argon edge had a slight discontinuity in its intensity distributed for the 0.1-mm. spectrometer slit. A photograph taken with 0 025-mm slit shows the dissolution of the edge, giving a secondary one at 2.0 $\pm$ 0.4 X. U. distance, corresponding to 1.7 v. An argon K electron removed to an optical orbit is similar to a potassium valence electron (except in its term structure) and will exhibit a max. $(2p - 3p)$ term difference of 1.4 v., possibly also a $1s - 2p$ of 1.6 v. The work is continued on neon. B. J. C. VAN DER HOEVEN

A new type of absorption spectrum: double rotational quantification in formaldehyde. VICTOR HENRI AND SVEND AAGE SCHOU. *Nature* **118,** 225(1926).—The ultraviolet absorption spectrum of HCHO vapor corresponds to a type of rotational spectrum with two quantifications; the stronger lines are produced by rotation about the axis of symmetry with the smaller moment of inertia J_0 and the closely grouped fine lines arise from rotations about a perpendicular axis with the moment K_0. The 2 moments of inertia of the normal mol. of HCHO are $J_0 = 1.41 \times 10^{-40}$ and $K_0 = 25 \times 10^{-40}$; therefore the distance between the H atoms is 1.30×10^{-8} cm. and between the C and O, 1.0 $\pm$ 0.1 A. U. For the activated mol. 2 values of the moments of inertia are found, *viz.*, $J_1 = 1.56 \times 10^{-40}$ and $J_1' = 1.51 \times 10^{-40}$ The distance between the H atoms is increased by the activation from 1.30 to 1.37 A. U. W. F. MEGGERS

Infra-red absorption in ethers, esters and related substances. ALPHEUS W. SMITH AND C. E. BOORD. *J. Am. Chem. Soc.* **48,** 1512–20(1926).—Absorption spectra between 1μ and 2.5μ were studied for a series of ethers, esters and related compds. Variations in mol. structure of these compds. alter the intensity of the absorption band but do not change its position. Expts. with CH_2ClCH_2Cl, $CHCl_2CHCl_2$, $CHCl:CCl_2$ and CHCl:-CHCl show a decrease in intensity of the bands with a decrease in the no. of C-H linkages. The bands observed in this region are due to C-H linkages and can be expressed approx. as a harmonic series. J. E. SNYDER

Regularities in the spectra of fluorine and chlorine. T. L. DE BRUIN. *Verslag Akad. Wetenschappen Amsterdam* **35,** 751–5(1926).—The spectrum of F has 50 lines in the red (*I*), 30 in violet (*II*) (cf. Gale and Monk, *C. A.* **18,** 1785). Const. frequency differences occurring in *I* are 145.5, 160.1 and 274.6, in *II* 12 and 20. From the 160.1 and 274.6 in agreement with Carragan's (*C. A.* **20,** 1950) Zeeman-effect measurements, the existence of a three-fold 4P term is assumed. A table of possible term combinations is given under reserve. In the Cl spectrum differences corresponding to 145.5, 12 and 20 are found at 530.5, 40.5 and 67.2. The ratios of the Cl/F differences 3.6 and 3.3 are near to the ratio of the square of the atomic numbers 3.57. B. J. C. VAN DER H.

Remark on the work of C. Schaefer and B. Philipps: "The absorption of carbonic acid and the structure of the carbon dioxide molecule." D. M. DENNISON. *Z. Physik* **38,** 137–40(1926).—Discussion of the possible mech. model derived from infra-red spectrum observations on CO_2 (*C. A.* **20,** 2282), in which some difficulties with the theoretical explanation are pointed out. W. F. MEGGERS

The absorption spectra of salt solutions of some rare earth elements. TOSHI INOUE. *Bull. Chem. Soc. Japan* **1,** 9–13(1926).—The absorption spectra of chlorides of La, Ce, Pr, Nd, Sm and Er were studied and compared with results published up to the present time. Contrary to other reports on the mutual influences of the absorption spectra of mixed solns. of rare earth salts it is established that the character-

istic bands, 4441 A. U. of Pr, 5222, 5205, 5123, 5091 A. U. of Nd, and 4071, 4013 A. U. of Sm remain unchanged in mixed solns. and these elements may therefore be detected by means of these absorption bands. In the ultra-violet $PrCl_3$, $NdCl_3$ and $LaCl_3$ absorb continuously, but $CeCl_3$ shows two bands, 3350 and 2460 A. U., $SmCl_3$ and $ErCl_3$ one each at 2600 and 2470 A. U., resp. A method for the quant. analysis of Ce and Sm by measuring their characteristic ultra-violet absorptions is described. W. F. MEGGERS

Resonance of lithium vapor. A. BOGROS. *Compt. rend.* **183,** 124(1926).—By a method similar to that used by Dunoyer for Na exptl. proof has been given that the first doublet of the principal series constitutes for Li the wave of resonance. The part of the jet bathing the exciting light became visible as soon as the temp. of the oven attained 540°. L. D. ROBERTS

The fine structure and the wave lengths of the Balmer lines. WM. V. HOUSTON. *Astrophys. J.* **64,** 81-92(1926).—The first 3 lines of the Balmer series in H at the temp. of liquid air were studied with a Fabry-Perot interferometer. Each line is a doublet with the differences of wave-no. 0.315 for H_α, 0.331 for H_β and 0.353 for H_γ. The abs. wave lengths are 6562.852 and 6562.716 for H_α, 4861.362 and 4861.284 for H_β, and 4340.497 and 4340.429 for H_γ. These values give 109677.70 ± 0.04 for the Rydberg const. The doublet sepn. decreases and the intensity of the component of short wave length increases with an increase of current. The doublet sepn. in the light from the end of the discharge tube is greater than in that from the side when the current is high. These observations may be explained by assuming that the "forbidden" components for which $\Delta k = 0$ are present, are polarized with the elec. vector parallel to the tube, and increase in intensity with an increase of current. W. F. MEGGERS

The continuous spectrum of hydrogen. IRA M. FREEMAN. *Astrophys. J.* **64,** 122-7(1926).—A continuous spectrum of H extending from the yellow-green region into the ultra-violet is excited in a discharge tube equipped with a hot, coated cathode. Intensity measurements in the visible spectrum with a spectrophotometer indicate that the continuous glow has its max. energy between 4800 and 5100 A. U. W. F. M.

The phosphorescence of metallic sulfides. A. A. GUNTZ. *Bull. soc. chim.* **39,** 953-75(1926).—A summary of theories and exptl. data. Cf. *C. A.* **20,** 152, 2121. A. E. RUARK

Abnormal electron velocities and high-frequency oscillations in discharge tubes. F. M. PENNING. *Physica* **6,** 241-8(1926).—The abnormal velocities, observed by Langmuir (*C. A.* **20,** 332) in discharge tubes were studied. Repeating L.'s expts., P. found velocities up to 90 v. from collector tests for an anode-filament p. d. of 50 v. (0°, 0.0002 mm. Hg pressure, 1 cm. W filament, 2.5 × 2.5 cm. Ni anode at 4 cm. distance). Contrary to L.'s statements, however, P. found oscillations in the tube to be the cause of these abnormal speeds in every instance. A crystal rectifier with parallel galvanometer, electrodes in the neighborhood of the tube gave noticeable deflections. To eliminate the apparent wall influence a chrome-iron tube was constructed (25 cm. long) with filament, anode (the walls of the tube could also be used as anode) and collector inside the metal shield. For 20, 30, 40 and 59 milliamps. anode current, 50 v. potential an excess velocity (over 50 v.) was found, on using the anode itself, of 6, 25, 26 and 15 v.; on using the wall as anode 0, 0, 7 and 10 v. In a second tube contg. a closed Ni anode cylinder (2.5 cm. diam. and height) with two openings for the filament leads and slits (0.5 mm.) for the collector at 3 mm. distance outside the cylinder, the same effects were noticed, always accompanied by oscillations. For a mercury-filled tube, 24°, 49 milliamps. anode current, 17.4 v. anode potential, wave lengths of between 50 and 100 cm. were measured on a Lecher system. They persisted and did not change if the collector was connected to the anode. In A the same effect appeared; for 0.003 mm. pressure, 100 milliamps., 55 v. a wave length of 50 cm. was found. The stationary oscillatory state was reached only after a certain period of time; during the first few min. no abnormal speeds occurred, gradually current and potential changed, then jumped into the final state, 20 v. excess speed and oscillation. From expts. in the chrome-iron tube it was apparent that the abnormality does not increase with the collector anode distance. From 70 v. at 3 mm. distance the max. speed dropped to 47 v. at 65 mm. distance, contrary to Langmuir's theory. The new type of oscillations observed, frequency about 10^9 per sec. are essentially different from Barkhausen oscillations; the third tube element can be left out. They are characteristic for the diode. B. J. C. VAN DER HOEVEN

The luminescence of potassium vapor in the electrodeless discharge. G. BALASSE. *Bull. sci. acad. roy. Belg.* [5] **12,** 193-201(1926).—A SiO_2 tube 3 × 10 cm. contg. the K vapor is placed inside a coil forming part of an oscillating circuit, and the whole is surrounded by an elec. furnace. A spark gap in parallel with the coil permits voltage regu-

lation. The luminescence is not stable below 180°; at this temp. it is violet, becoming mauve around 280° and completely yellow above 310°, while at 350° all luminescence disappears. Spectroscopic data are given for the yellow luminescence (6940–4195 A.U.) and for the violet luminescence (6580–2380 A.U.), the former corresponding with the arc spectrum of K, the latter apparently most closely resembling the spark spectrum.

W. B. PLUMMER

Problems of cathode dispersion. I. The nature and charge of the metal particles emitted in cathode dispersion. ARTUR V. HIPPEL. *Ann. Physik* **80**, 672–706(1926).—To det. the size (at. or not) of metal particles as emitted from a metal cathode in a glow discharge, H. worked out a spectrographic method for detn. of the vapor pressure of the metal inside the tube. Comparison of the vapor pressure (no. of particles per unit vol.) so obtained with the vapor pressure value derived from the weighed amt. of metal pptd. on some target inside the tube will show whether the metal arrived at the target in at. form. The spectrographic vapor pressure detn. was based on the detn. of the ratio of intensity of some spectral line of the metal with that of a neighboring spectral line of a second metal present in the tube in known concn. (Hg. vapor). If equal excitation conditions prevail in the tube for both metals, *i. e.*, the available electron potential in excess over the individual resonance potentials, if homologous elements with resonance lines of neighboring frequency are used (*e. g.*, $1s-2p_2$ lines of Hg and Cd) the transition probabilities and quantum weights will be equal for both elements and the intensity ratio J_1/J_2 will equal CN_1/N_2 (C a const. can be found from the intensity ratio of the lines at equal temps., N_1 and N_2 are the nos. of particles per unit vol.). From the no. of atoms P pptd. per sec. on the target, Ω the mean velocity, m the mass and L the mean free path of the metal atoms follows on the basis of the kinetic theory, 1 dimensional diffusion of the metal atoms (uncharged) through the tube being assumed, for the metal gas pressure at a distance a from the target $p_C = 8mPa\Omega/3\pi L$. This formula is rather approx. and constitutes an upper limit. To avoid secondary reactions in the tube A was used as filling gas; the app. consisted of a quartz half balloon (40 cm. diam.) on a glass plate and provided with 2 plane parallel quartz windows. Inside the balloon were a water-cooled 12-cm. circular Cd cathode, at a distance of 8 cm. from the parallel cooled Cu anode; a glass target (microscope slide 2.5 × 7.5 cm.) was at 2 cm. from the anode. Purified A laden with Hg of any desired vapor pressure could continuously be sucked through the system. A detailed description is given of the method for evaluation of the measured blackening of the photographic plates: blackening law, calcn. of the image formation of the entire optical system, dispersion of the spectrograph, etc. A set of intensity standards was impressed on every plate after a spectrum exposure by means of arc light going through the entire system. Measurements were made with the Cd cathode, 0.1 mm. A pressure (second-order collisions few), 1500 v. potential, 50 milliamps., Hg vapor at room temp.; difficulties were experienced because of the rapid disappearance of part of the Hg vapor by absorption. By graphical extrapolation from the results at several times (exposure $1^1/_2$ min.) the Hg_0/Cd ratio could be found for the Hg pressure at zero time with reasonable accuracy. The value found for Hg_1/Cd is 20 ± 50%. Including dispersion ratio and blackening consts. (2 and 7, resp.) the true intensity ratio is 280 ± 50%. The value for Cd used (cf. Kuhn, *C. A.* **20**, 1177) was 15, Hg pressure 1.10^{-3} mm., giving a Cd pressure at 1.4 cm. before the target of $5.4. \times 10^{-5}$ mm. From the pptd. metal $p_c = 2.4. \times 10^{-4}$ mm.; the latter value is at least twice too high. The result proves that a large part if not all of the dispersed particles is present as atoms. Measurements on Zn less easily dispersable (lower Hg pressure had to be used) yielded $p_S/p_C = 12$, confirming the theory. Measurements of Ag dispersion (no trouble was experienced with Hg disappearance) partly as a control on the spectrographic method, showed that the comparison between Ag and Hg spectral lines is not allowable on account of the far different character. The charge conditions of the dispersed particles were separately examd.; a condenser was erected perpendicular to the target attached to it. The absence of charge, also evident from the escape of the particles from the cathode (negative charge would *per se* be unlikely), was hereby proven; up to 550 v. when ionization by impact sets in, the metal distribution over the target was independent of the condenser charge.

B. J. C. VAN DER HOEVEN

The work function of oxide cathodes. H. ROTHE. *Z. Physik* **36**, 737–58(1926).—The work of emission of electrons from several com. oxide tubes was detd. and found in some cases to be as low as 0.8 v. Comparison of the emission with the gas pressure showed that such tubes can never be made gas-free, probably because the emission current itself decomposes the oxide continuously. The high emission of these cathodes is probably due to the metallic particles which are formed by the decompn. of the oxide

and which remain embedded in the oxide. The work of emission was detd. by the cooling effect and gave values close to those of Richardson's equation in the case of satn. currents but at less than satn. the cooling effect is much greater than the work function demands. The fatigue of oxide cathodes is attributed to the gradual decompn. of the oxide. G. L. WENDT

Note on the work of H. Rothe, "Work function of oxide cathodes." ANNEMARIE KATSCH. *Z. Physik* **38**, 407–9(1926).—A criticism of the work of R. (preceding abstract), together with new and confirming exptl. data. J. H. PERRY

Reply to the note of A. Katsch. H. ROTHE. *Z. Physik* **38**, 410(1926).—Reply to preceding abstract. J. H. PERRY

The change in color of barium cyanoplatinite by the action of Röntgen rays and heat. A. TRAPESNIKOV. *Z. Physik* **37**, 844–58(1926).—A Konig-Marten spectro-photometer was used to study color changes of Ba cyanoplatinite tablets produced by x-rays, heat and light. Reflection curves are plotted for the various colored products. The green tablet gives a primary active band at λ = 480–570$\mu\mu$ with a max. at approx. 520$\mu\mu$ where max. reflection change occurs. X-rays cause a color change from green to yellow. This change is proportional to the time of exposure until satn. is reached. Subsequent exposure to light partially restores the green. A tablet thus treated changes color more slowly and reaches satn. sooner when again exposed to x-rays A fresh tablet changes color from green to red or orange upon heating at 47–52.3°. This change is more intense than that produced by x-rays Light does not restore the green color. The temp. coeff. of the reaction from 37.3° to 52.3° is 3.10 $\pm$ 0.15 The reaction produced by heating is preceded by an induction period, the duration of which decreases with increasing temp. This period is longer for a tablet previously exposed to x-rays or heat than for a fresh one Reaction-velocity curves show that according to the induction period the kinetics of the 3 reactions are of the same character. Analogous curves are obtained for the color change of $CuSO_4.5H_2O$ caused by heating It is concluded that the color change of Ba cyanoplatinite is due to dehydration. J. E. S.

Location of the electromotive force in a photo-active cell containing a fluorescent electrolyte. C. C. MURDOCK. *Proc. Nat. Acad. Sci.* **12**, 504–7(1926).—A Goldman cell in which the illumination could be directed upon any part of the cell was constructed The electrolyte was made to flow past the electrodes at variable speeds. The data indicate that the photo-active e m. f. is due in part to the action of light on fluorescent electrolyte even when the electrode is not illuminated. It is probable but not certain that illumination of the eletrode results in an e. m. f. G. G. SWARD

Fluorescence, phosphorescence, chemiluminescence, and activation of molecules. N. DHAR. *Z. anorg. allgem. Chem* **155**, 303–10(1926).—A discussion of a variety of observations on fluorescence and chemiluminescence spectra Dhar points out that fluorescence is not always associated with chem. change and offers explanations of differences between the fluorescent and chemiluminescent spectra of many substances A. E. RUARK

Parallelism between the fluorescent power and the velocity of reaction. JEAN PERRIN AND MLLE. CHOUCROUN. *Compt. rend* **183**, 329–30(1926).—The parallelism between Arrhenius' theory that the velocity of reaction depends on the *active* mols. or ions and the recent quantum theory of luminescence is shown. The active mols. of Arrhenius are formed by the absorption of a quantum (luminous or kinetic) and the ordinary state is regenerated with fluorescence L. D ROBERTS

Fluoremetry. II. The relation between fluorescence and hydrogen-ion concentration. L. J. DESHA, R. E. SHERRILL AND L. M. HARRISON. *J. Am. Chem. Soc.* **48**, 1493–1500(1926); cf. *C. A.* **14**, 2453.—Dil. solns. of the following compds. were investigated: Na 1-naphthol-4-sulfonate, 2-naphthol-3,6-disulfonic acid, Na 1-naphthol-2-sulfonate, quinine, K salts of resorcinol and of hydroquinol-disulfonic acid Approx. 75% of the total change of intensity of fluorescence occurs within a range of p_H 0.2. Marked similarity of intensity and of theoretical dissociation curves for weak electrolytes (p_H as abscissa) suggests a relationship between fluorescence and dissocn. At a fixed H-ion concn., increase of neutral salt content of the solns decreases the intensity of fluorescence. Cl ions inhibit the fluorescence of the sulfonic acids. J. E. SNYDER

Radiochemistry of fluorescent substances. MLLE. CHOUCROUN. *Compt. rend.* **183**, 357–9(1926).—Using new methylene blue and eosin dissolved in glycerol the velocity of destruction of fluorescent substances was found to decrease rapidly as the concn. increases. Glycerol of definite viscosity was used. The results were irregular till buffer solns. were prepd. H ions retard, and OH ions accelerate the velocity of reaction. L. D. ROBERTS

The gaseous reactions of active hydrogen. E. Boehm and K. F. Bonhoeffer *Z. physik. Chem.* **119,** 385–99(1926).—The reactions of H activated by the luminous discharge have been studied semiquantitatively for the following substances: O_2, H_2O, N_2, NH_3, Cl_2, HCl, Br_2, HBr, H_2S, CH_4, CO, CO_2 and CH_3Cl. The H behaves as though it consisted of free atoms. With O_2 it forms directly H_2O_2; with CO and CO_2 it forms small quantities of CH_2O. The halogens, which react very rapidly, form H halides The active form of H is rapidly and completely destroyed by HCl, HBr, H_2S and CH_3Cl, probably because of reactions like $H + HCl = H_2 + Cl$. N_2, H_2O, NH_3 and CH_4 are indifferent. Small quantities of O_2 increased the yield of active H_2 as they also increase the intensity of the Balmer spectrum; but the other gases tried had no effect A. W. Kenney

The energy of dissociation for nitrogen and oxygen. Hertha Sponer. *Naturwissenschaften* **14,** 275(1926).—From the dissocn. energy (Sponer, *C. A.* **20,** 1355), 11.4 v. for N_2 and the ionization energy for N (Hund, *Z. Physik* **34,** 226(1925)) 12.2 v a value 23.6 v. for $N_2 \longrightarrow 2N^+$ follows in agreement with the "second" ionization potential of N_2 as detd. by Hogness and Lunn (*C. A.* **20,** 704). Similarly it follows from data of Smyth (*C. A.* **19,** 209) on the second ionization potential 22 v. for O_2 and of Hopfield (*C. A.* **17,** 3833) for the ionization potential of 13.6 v. for O, that the dissocn energy of O_2 is about 8 v. This value may be slightly too high (cf. Wulf, *C. A.* **19,** 2593 and unpublished data of Hogness). B. J. C. van der Hoeven

Light and chemical reactions. Jean Perrin. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926,** 322–98.—A detailed and largely mathematical discussion of the quantum theory, dealing with mol. metamorphoses (production of "activated" or "critical" mols.) and emission and absorption of quanta and showing their application in the case of essential elementary reactions, mol. induction (fluorescence) and radiochemistry (phosphorescence, photochem. reactions). *Ibid* 399–416—Discussion by A Berthoud, J. Perring, H. von Euler, F. Swarts, A. Job, E. K. Rideal, F. M. Jaeger, Timmermans, H. Briner, M. T. Lowry and H. E. Armstrong. A. Papineau-Couture

The action of light on concentrated aqueous solutions of ammonium thiocyanate. Marshall Holmes. *J. Chem. Soc.* **1926,** 1690–3.—If fresh concd. solns. of NH_4SCN are exposed to ultra-violet light in glass containers, a reddish color develops but fades soon. An unanalyzed gas was evolved. Re-exposure causes the color to reappear. The source of light may be solar or that from the W, C or Fe arc. If quartz glass is used as container S separates from soln. H. believes that the absorption of long-wave ultra-violet light (passed by glass) causes the irreversible photoreaction $NH_4CNS \longrightarrow NH_4CN + S$ (as sol); that the insol. S forms aggregates of sub-microscopic size which are responsible for the pink color; that these particles recombine and cause the color to fade. KCN and shorter wave length ultra-violet light (passed by glass) accelerated recombination. No solns. less than 4 *N* exhibited these phenomena. M. O. L.

Mechanism of reactions photosensitized by mercury vapor. A. L. Marshall. *J. Phys. Chem.* **30,** 1078–99(1926).—A method is developed for measuring the amt. of energy absorbed by Hg vapor from a H_2O-cooled quartz-Hg arc and for calcg. the energy radiated by this arc. The temp. coeff. of absorption by Hg in the presence of H_2 and N_2 is unity. H_2O_2 is the first isolable product of the photochem. reaction between H_2 and O_2 when sensitized by Hg vapor. The mechanism for this reaction is $Hg' + H_2 = 2H + Hg; H + O_2 = HO_2; HO_2 + H_2 = H_2O_2 + H; 2H_2O_2 = 2H_2O + O_2$. The max. yield for a mix. of $2H_2 + O_2$ was 6.6 mols. H_2O_2 per quantum of 2536.7 A U. absorbed. The max. yield for the reaction $CO + H_2 = HCOH$ was 6 mols. per quantum for a mixt. of compn. 37 cm. CO and 34.6 cm. H_2. These are minimal values for the quantum yield. The reactions must have some "chain mechanism" and the Einstein-Stark photochem. equivalence law does not hold. Harry B. Weiser

Application of quanta in the theory of chemical reactivity. S. C. Roy. *Z. Physik* **34,** 499–509(1925).—In spite of the severe criticism to which the radiation theory of chem. reactivity has been subjected, its value remains great in the absence of any other valid hypothesis. The velocity of the change $AB \longrightarrow A + B$ is detd. by the no. of collisions of AB with light quanta, and the reverse process by the no. of collisions between A and B. From considerations of the effective diam. of quanta and atoms an expression is obtained for the velocity consts. of the 2 reactions and is extended to include mols. previously activated. Ionization of a gas is regarded as the simplest type of chem. change; thermal ionization of gases and thermionic emission of hot bodies are treated as special cases of heat reactions. B. C. A.

The law of photochemical equivalence. P. Lasarev. *J. chim. phys.* **23,** 515 (1926).—A discussion is given of the development and units of Einstein's law of photochem. equivalence. Data from the literature are quoted to prove that the law fits the

exptl. facts only in a few exceptional cases. By a consideration of the Bohr atom L. believes that the deviations of expt. from theory may be accounted for. W. J. S.

Primary actions of photochemical absorption. (Optical-photochemical transformation of radiation.) G. KÖGEL. *Z. wiss. Phot.* **24,** 216–8(1926).—K. regards 2 possibilities in photochem. absorption: (1) The action takes place between the atoms or mols. (2) The action takes place within the atoms. Investigations on the photochem. behavior of *o*-nitrobenzaldehyde and other org. compds. are described. The thermal light absorption excites the atoms and is in the beginning identical with the photochem. absorption. The photochem. effects are influenced by addn. of foreign substances, which shows action between mols. A. P. H. TRIVELLI

Decomposition of ammonia by ultra-violet rays. WERNER KUHN. *J. chim. phys.* **23,** 521–44(1926).—The photochem. decompn. of NH_3 has been studied under the influence of monochromatic light (λ = 2025–2140 A.U. (rays of Zn)). The no. of quanta absorbed per mol. of NH_3 decompd. was found to be 2.2. This value appeared to be independent of the pressure. The speed of decompn. was independent of the temp. and catalytic effect, but was dependent on and directly proportional to the amt. of energy absorbed. Strictly monochromatic light appeared to have a lesser effect than mixed light so that K. believes that the decompn. is a progressive photochem. reaction and not one brought about by a single quantum $h\nu$. W. J. S.

The formation of hydrogen peroxide from detonating gas by optically activated mercury atoms. K. F. BONHOEFFER AND S. LOEB. *Z. physik. Chem.* **119,** 474–6 (1926).—The work of Taylor, Marshall and Bates (cf. *C. A.* **20,** 2792) on the direct formation of H_2O_2 from activated H and O is confirmed. Although the peroxide does not form when the radiation is from an uncooled lamp and is not formed with a cooled lamp when Hg vapor is absent from the reacting gases, it is formed in considerable amts. when the Hg vapor is present and the Hg lamp is cooled. A. W. KENNEY

The ionization produced by the hydration of quinine sulfate. MLLE. C. CHAMIE. *J. phys. radium* **7,** 204–14(1926).—A parallelism is shown between the decreasing of the ionization current and the increasing of wt. by absorption of water. Simple relations hold for the duration of the phenomenon, the density of the layer of salt and the initial intensity of the ionization current. For small quantities of salt the total quantity of electricity obtained during the hydration is very closely proportional to the quantity of water absorbed. L. D. ROBERTS

Some experiments with the photolysis of hydrogen-iodide gas in the light of the mercury quartz lamp. M. TRAUTZ AND B. SCHEIFELE. *Z. wiss. Phot.* **24,** 177–216 (1926).—The photochem. decompn. takes place quantitatively. Neither recombination in the light nor decompn. in the dark was observed at the temp. of the expt. The active part of the spectrum is between 300 and 220 mμ. The velocity of decompn. is const. in the beginning but decreases near the end of the reaction. Quant. data are given with an investigation of the influence of temp. and pressure. A. P. H. TRIVELLI

The chlorine-hydrogen reaction. NATHANIEL THON. (With preface by MAX BODENSTEIN.) *Fortschritte Chem. Physik physik. Chem.* **18,** No. 11, 3–88(1926).—A crit compilation of papers on this subject. It is shown that most exptl. observations agree with the following empirical equation of this reaction: $\frac{dx}{dt} = \frac{kT_0[Cl_2]^2[H_2]}{k'[H_2][O_2] + k''[Cl_2]}$. This equation is based on the assumption of the existence of active and excited mols. The formulation of the Cl–H reaction by the assumption of at. chains does not agree with the exptl. findings. The disagreement between theory and expt. is shown in the following phenomena: the retardation of the reaction by O_2, the dependence upon light intensity, the temp. coeff. of the reaction and the catalytic action of I_2. Coehn and Jung's theory of the influence of the vapor tension and the wave length is discussed and a modified theory is suggested, the basis of which is a functional relation between humidity and wave length. EMIL KLARMANN

The decomposition of potassium manganioxalate in plane-polarized, circularly polarized and ordinary light. J. C. GHOSH AND A. N. KAPPANNA. *Quart. J. Indian Chem. Soc.* **3,** 127–40(1926).—$Mn(OAc)_3$ in concd. soln. of $K_2C_2O_4$ gives a soln. of deep red color due to the formation of K manganioxalate. The velocity of decompn. of this compd. under the same intensity of plane-polarized and ordinary light is almost the same. Circularly polarized light is a little more effective. Tables and graphs are given showing the mol.-extinction coeffs. of K manganioxalate in various regions of the spectrum. Reaction velocities measured at 6° and 16° in both the dark and in ordinary white light are given. Similar measurements were taken when $H_2S_2O_4$ was added to the original soln. This was found to depress the velocity of decompn. both in darkness and light. Applying Einstein's law of photochem. equivalence to the

measurements carried on in plane-polarized light showed that 1 quantum was required to transform 1 mole of the compd. R. C. ROBERTS

The yield of photochemical reactions with complex light compared with the yield with the component parts of the light. III. M. PADOA AND NERINA VITA. *Gazz. chim. ital.* **56**, 375–88(1926).—In continuation of previous work (*C. A.* **20**, 2951), the *bromination of cinnamic acid induced by light* (cf. Plotnikov, *C. A.* **6**, 2202; Bruner **7**, 265) was studied. Since the solvent influences the rate of the reaction (cf. Herz and Mylius, *Ber.* **39**, 3816(1906)) the expts. were carried out in CCl_4 and in $CHCl_3$. The law of proportionality between the intensity of the illumination and the photochem. reaction does not hold true for all intensities, though no general rule could be derived. This anomaly was peculiar to the reaction, for similar expts. on the oxidation of HI show the latter to conform to the proportionality law. When successive exposures were made, each time with a fresh soln. for each monochromatic light, the yield was greater with the monochromatic components than it was with white light of the same integral intensity, the ratios being 1.89 in CCl_4 and 1.74 in $CHCl_3$. This method involved differing induction periods for each component, the sum of which was greater than that for white light. Allowing for this complication by suitable preliminary exposures, it was found that in $CHCl_3$ successive exposures to the monochromatic components in the order, violet + red, blue and green, gave a yield of 284% of that with white light of the same integral intensity, whereas on successive exposure in the opposite order the yield was 233%. In CCl_4 under the same conditions the yields were 374 and 233%, resp. The results differ in an unexplainable way from the previous ones (*loc. cit.*). Interposing a $NiSO_4$ soln. which absorbed 55% of the total radiant energy of the white light between the reaction mixt. and the source of light did not change the yield of the reaction. Likewise in the *oxidation of HI*, an ammoniacal $CuSO_4$ soln. which absorbed 53% of the radiant energy of white light gave about 25% greater yield than did the integral white light. C. C. DAVIS

Influence of some radioactive elements on the catalytic activity of certain proteobismuthic precipitates. EUGENE LABORDE, JEAN BRESSOLLES AND LEON JALOUSTRE. *Compt. rend.* **183**, 354–6(1926).—Proteo-bismuthic compds. more active catalytically than the simple Bi ppts. were prepd. Materials and solns. for their prepn. are given. L. D. ROBERTS

Microscopic changes of certain anemias due to radioactivity (MARTLAND) **11G.**

Fluorescent material. S. E. SHEPPARD. U. S. 1,602,593, Oct. 12. Ca tungstate or other tungstate having high fluorescent properties when excited by x-rays is assocd. with a V compd. such as Na or NH_4 vanadate, which under oxidizing conditions insures the presence of vanadic acid in order to form fluorescent x-ray screens. U. S. 1,602,594 specifies compds. of Mo instead of W compds. for similar compns., *e. g.*, Na or NH_4 molybdate.

X-ray protective material. W. G. LINDSAY. U. S. 1,602,688, Oct. 12. A material for protection against injurious effects of x-rays comprises nitrocellulose, tricresyl phosphate and a substance such as Bi subnitrate, which is impervious to x-rays, diffused throughout the mass, which may be formed into flexible sheets.

4—ELECTROCHEMISTRY

COLIN G. FINK

Future trends in electrochemistry. WM. BLUM. *Ind. Eng. Chem.* **18**, 1028–31 (1926). E. J. C.

Swiss products of the electric furnace and electrolytic cell in 1925. ANON. *J. four électrique* **35**, 177–80(1926).—A review. C. G. F.

Conduction of gas from the electric furnace. P. BUNET. *J. four électrique* **35**, 196–201(1926). C. G. F.

Alloy iron made electrically. ANON. *Iron Age* **118**, 764–5(1926).—Elec. furnace alloy cast iron is marketed as die blocks, hammer dies, automobile parts, special molds for the glass industry, heat-resisting iron for furnaces and ovens, and has proven superior to ordinary cupola iron. Excellent thin-walled castings discount the theory that high P is essential to the pouring of thin sections. These castings possess soundness, d. and close-grained structure with ready machinability. Cr and Ni cause decided changes in the structure of gray iron, imparting increased strength and hardness

and improving the machinability. Small-section castings have a dense, close-grained, pearlitic structure and are machinable at higher Brinell hardness than is possible with ordinary gray iron. Oxidation at high temps. showed, under like conditions of time and temp., 2% on the alloy iron and 30% on the cupola iron. W. H. BOYNTON

The protection of aluminum and its alloys against corrosion by anodic oxidation. G. D. BENGOUGH AND H. SUTTON. *Engineering* **122,** 274–7(1926).—B. deals with details of treatment of Al alloys by anodic oxidation, particularly duralumin for aircraft parts, the results of testing these specimens in seawater, and the development of the process on tech. lines. The nature of the film formed, preliminary investigations on anodic treatment, exptl. treatment of cast Al alloys, anodic oxidation producing base for paints, dyeing of anodic films, and exptl. anodic treatment on a larger scale are discussed. The best oxide coating was obtained on various alloys when the soln. contained 3% CrO_3 and was used at a temp of 40°. Alloys contg. over 5% Cu could not be treated satisfactorily, as the film broke down at about 30 v. Al-Si and Al-Zn alloys can be treated satisfactorily, though the former contg. 7.5–8.75% Si caused high current consumption. Details are given regarding soln. elec equipment, support of the work during treatment and elec. contact, anodic treatment of Al and duralumin, including some costs of the latter Anodic oxidation followed by dipping in molten lanolin, a 15% soln. in C_6H_6, or into a lanolin emulsion, afford the best protection against water-line corrosion. The app. employed and several curves are shown. W. H. BOYNTON

Aluminum nitride: its history. R. PITAVAL. *J. four électrique* **35,** 193–5(1926). C. G. F.

Notes on heavy and rapid copper deposition. J. S. SUNDERLAND. *Metal Ind.* (London) **28,** 367–8(1926) – In the acid $CuSO_4$ bath, best results are dependent upon temp. of soln., d and c d. Each factor is discussed. The best conditions are a temp upward of 22°, a d. of 19° Bé , and a c. d. of 15 amp /sq ft (9 28 sq. dm). W H. B

Behavior of lead anodes in electrolysis of zinc sulfate solutions. H. HOCK AND F. KLAWITTER. *Metall u. Erz* **22,** 377(1925) – The anode must be of very pure electrolytic Pb Chlorides in soln are harmful. Circulation of electrolyte is necessary to form a good Zn deposit, but it causes more rapid corrosion of the anode by removal of the film of PbO_2, so should not be excessive. A crystalline coating of PbO_2 may be built up on the anode by electrolyzing 1 day with dil. H_2SO_4 and a c. d. of 20 to 50 amp. per sq. m. C. G. KING

Modern automatic nickel-plating baths. CONSTANTIN REDZICH. *Apparatebau* **38,** 200(1926); 1 cut.—In the "Torpedo" bath, the work is automatically fed and passed through the electrolyte; current is used at 4–5 v.; plating is done in 15–20 min , and costs are reduced by 50%. J. H MOORE

Measurement of $\frac{dE}{dT}$ of mercurous sulfate electrode, and the application of mercurous sulfate electrode to secondary-battery testing. S. MAKIO. *Researches Electrotechn. Lab.* (Japan) No. **174,** 20 pp.(1926).—Single p. d. of N Hg_2SO_4 electrode was measured by the aid of N calomel (Ostwald) electrode, which was, in turn, accurately compared with a N hydrogen (Nernst) electrode. The result at 18° was found to be 0.6758 v. on the hydrogen scale, and the temp. coeff.—0.00026 v. per degree. The e m. f. of NHg_2SO_4 electrode at t° is represented by the equation: $E_t = 0.6758 - 0.00026 (t - 18)$. Application of this standard electrode to secondary-battery testing is described. W. OGAWA

Electrical precipitation as applied to gas streams. H. R. HANLEY. School Mines, Met., Univ. Missouri, *Bull.* Tech. Series **9,** No. 2, 64 pp.(1926).—A compilation of data on the fundamentals and practice of elec. pptn. in relation to gas streams. Research work is described and a summary of the principles involved is given. Chapters include: characteristics of positive and negative corona, the effect of dielectrics on sparking voltage, velocity of the gas stream, the kind and amount of current, elec. equipment, temps., practical consideration of conditioning of the gas stream, detn. of suspensoids and a bibliography. W. H. BOYNTON

The temperature distribution on the bulb surface of incandescent vacuum and gas-filled tungsten lamps. M. HORIOKA, T. SATO AND K. YAMAMOTO. *Researches Electrotechn. Lab.* (Japan) No. **169,** 7 pp (1926).—Various shades and globes used for incandescent vacuum and gas-filled W lamps may affect considerably the temp. distribution on the bulb surface and socket. Poor basing cement will deteriorate in a short time when the temp. is sufficiently high. The researches were made on 36 kinds of shades, combined with 100 to 20 W gas-filled and 50 to 24 c. p. vacuum lamps. The bulb axis was varied between 0° and 180° (or from tip-down to tip-up position). The

temp. on the bulb surface and the socket was measured by iron-constantan thermocouples. The largest temp. variation and highest bulb temp. for gas-filled lamps appears at the point of the bulb on the same level as the filament when the lamp is set in horizontal position. Differences in shade design are generally of smaller effect than the effect of the degree of inclination of the gas-filled lamps. W. OGAWA

Methods of manufacture of neon illuminating tubes. R. W. LOHMAN. *Trans. Illum. Eng. Soc.* **21,** 478–82(1926). C. G. F.

The year's progress in illumination (1925-1926). F. E. CADY, G. S. CRAMPTON AND W. E. SAUNDERS. *Trans. Illum. Eng. Soc.* **21,** 685–803(1926).—There were 62,000,000 gas mantles used in Great Britain in 1924. The use of C_2H_2 for lighting is growing. The 1000-c. p. W arc lamp (d. c.) has a total luminous flux of 8500 lumens (21.2 lumens per watt). C. G. F.

Temperature of a contact and related current-interruption problems. J. SLEPIAN. *J. Am. Inst. Elec. Eng.* **45,** 930–3(1926).—A formula is derived for the temp. rise of the last contact point of a pair of separating electrodes. Expts. on the interruption of elec. current in vacuum are described. Even with a vacuum of 0.001 mm. a luminous flash was produced with currents as low as 1 or 2 amperes. C. G. F.

Refractory articles from tungsten powder. J. HÄRDÉN. *Chem. Met. Eng.* **33,** 543–4(1926).—The prepn. and properties of crucibles, rod and tubes for high-frequency furnace work are outlined. Ordinary W powder (98.5–99%) ground to 80–90 mesh is sprinkled with a small quantity of luke-warm water and well mixed. About 10–12% of a warm 25% water soln. of glucose is gradually added during kneading of the mass until it feels plastic and can be pressed into balls. Each particle of W powder must be well coated with a film of glucose soln. The excess is removed by stamping, after thorough kneading, in a tubular mold and then extruded. The molded article is fired at 1600° in a C tube furnace. Phys. and elec. characteristics of the powder are given. W. H. BOYNTON

Cryolite. ANON. *Mineral Ind.* **34,** 274–6(1925).—Production and source are discussed. A. B.

The inside frosting of incandescent lamps (PIPKIN) **19.** Determination of Ag, Au and Pt in anode slimes (ECKERT) **7.** Annealing alloys (Brit. pat. 243,006) **9.** Hydrogenation and production of non-sludging oils (for electric apparatus) (U. S. pat. 1,601,406) **22.**

Electric battery. J. PELLINI. Brit. 243,374, Nov. 22, 1924. A 2-fluid cell has a Zn electrode immersed in a soln. of NaOH and KOH and a C electrode immersed in a soln of chromic acid, Na_2SO_4 and H_2SO_4 or of "ferro-chromic" salt, Na_2SO_4, H_3BO_3 and H_2SO_4 or of $Na_2Cr_2O_7$, Fe sulfate, H_3BO_3, $KMnO_4$ and H_2SO_4. Structural features are described.

Electric battery. C. H. O. LÜBECK. Brit. 242,290, Oct. 31, 1924. Electrodes of the Ni-Fe type in batteries having alk. electrolytes are protected against deformation due to swelling of the active material by enclosing the electrodes in a sheath composed of 4 walls of sufficient stiffness to prevent bending. Other structural features also are specified.

Electric battery. O. S. FLATH. U. S. 1,602,402, Oct. 12, Structural features.

Electric batteries. SOC. ANON. LE CARBONE. Brit. 243,300, Nov. 19, 1924. A depolarizer such as MnO_2 (with or without graphite or wood charcoal and in either powd. or agglomerated form) is protected against the entry of liquid by a colloidal coating which may consist of arrowroot fecula or the colloidal solns. described in Brit. pat. No. 198,656 (*C. A.* **18,** 203) or Brit. pat. No. 211,832 (*C. A.* **18,** 1792) or of collodion or "cellophane" as described in Brit. pat. No. 206,471 (*C. A.* **18,** 1089). The colloidal coating may be applied to the inner surface of a porous receptacle contg. the depolarizing compn.

Electric battery with automatic depolarization. H. D. NYBERG. U. S. 1,601,036, Sept. 28. An electronegative electrode comprises a receptacle for an electroyte and is formed of 2 cohering layers both consisting mainly of C. The layer in contact with the electrolyte is formed of porous material such as coke and the other layer is impregnated with substances such as a silicate to prevent penetration of the electrolyte while permitting air to enter so that it effects depolarization.

Dry-cell electric battery. G. M. LITTLE and J. G. FORD. U. S. 1,602,915, Oct. 12. Structural features.

Electric dry battery. ČESKAZBROJOVKA ACK. SPOL. V. PRAZE. Brit. 242,984, Nov. 15, 1924. The external surface of C electrodes is electroplated with Cu. Various

structural features are specified adapted for batteries in which the Zn and C electrodes are mounted to form a shallow receptacle.

Dry battery. G. W. Heise. U. S. 1,601,475, Sept. 28. Structural features.

Depolarizing composition for dry batteries. E. C. Smith. U. S. 1,601,457, Sept. 28. A depolarizing mix comprises C, a depolarizing substance such as MnO_2 and an inert absorptive material, *e. g.*, diatomaceous earth.

Storage battery. W. B. Stone. U. S. 1,601,704, Sept. 28. Structural features.

Storage battery. H. M. Genese, G. R. N. Minchin and Pritchett & Gold & E. P. S. Co., Ltd. Brit. 243,239, May 6, 1925. Structural features.

Electrolyte for storage batteries. V. L. Williams and L. L. Williams. Brit. 243,537, Dec. 9, 1924. A mixt of H_2SO_4 of 1.2 sp. gr. 80 gals., Na_2SO_4 20 lbs., $MgSO_4$ 10 lbs. and "ammonia" 10 lbs.

Electrode composition. S. Dushman. Can. 263,947, Aug. 31, 1926. A cathode for electron-discharge devices comprises metallic W and an oxide of Ce.

Electrode composition. S. Dushman. Can. 263,948, Aug. 31, 1926. A cathode for electron-discharge devices comprises metallic W and an oxide of Yt.

Selenium cell. G. Dragonetti. U. S. 1,602,070, Oct. 5.

Electrolytic condensers. J. Slepian and E. J. Haverstick. U. S. 1,602,951, Oct. 12. An electrolyte for electrolytic condensers, lightning arresters, rectifiers, etc, comprises an aq. soln. contg. NaF or other fluoride in soln. together with film-forming substances such as reaction products of H_3BO_3, NH_4 borate and NaOH.

Electric resistances. S. Loewe. Brit. 242,625, Nov. 6, 1924. Pt wires are twisted and fused around a glass rod and Chinese ink, which may be thinned with alc., is sprayed on to the glass through a funnel contg heating coils. The operation is stopped when readings of a galvanometer indicate that the desired resistance is reached. The coated rod is then dipped in paraffin and may be packed in paraffin or other insulating material or enclosed in a vacuum vessel.

Light-sensitive electrical resistance device. S. Wein. U. S. 1,601,607, Sept. 28. A light-sensitive elec. conductive substance such as Se in soln. is spread upon a support, *e. g.*, a glass sheet, the surface of which may be preliminarily treated with a soln. of cellulose acetate and the solvent is then evapd from the soln. to leave a film on the surface which may be annealed. The preliminary treatment of the surface serves for the protection and uniformity of the film.

Electrolytic rectifier for charging batteries. E. W. Engle. U. S. reissue 16,438, Oct. 12. See original pat. No. 1,495,582; *C. A.* **18**, 2110.

Electrolytic rectifiers. R. F. Bossini. Brit. 242,688, July 17, 1924. In rectifiers such as those with cathodes of Al and anodes of Pb or Fe, the electrolyte is maintained at a suitable low temp. by circulating it through a sep. radiator by thermo-syphonic action.

Electric device for indicating liquid levels at a distance. C. Bornmann. Brit. 243,318, Nov. 20, 1924.

Device for indicating acidity or alkalinity of liquids. E. W. Todd. U. S. 1,601,383, Sept. 28. A primary cell with electrodes reversely affected by acid and alkali is connected, across its terminals, with a galvanometer graduated in terms of acidity and alky.

Apparatus for deoxidizing air in transformers or other electrical apparatus. C. J. Rodman and L. H. Hill. U. S. 1,601,326, Sept. 28.

Electrolytic cell for oxygen and hydrogen production. Montecatini, Soc. générale per l'industria mineraria ed agricola. Brit. 242,635, Nov. 7, 1924.

Carbon for depolarizing compositions. G. W. Heise. U. S. 1,602,850, Oct. 12. Conductive C is conditioned for use in depolarizing compns. by milling it with relatively hard, powd. non-depolarizing material such as sand.

Use of low-voltage currents for preventing incrustation in boilers, evaporating apparatus, etc. K Schnetzer. Brit. 243,415, July 31, 1924.

Electrolytic deposition of chromium. G. Le Bris. Brit. 243,667, Dec. 1, 1924. The electrolyte is prepd. by boiling $Cr_2O_3.2H_2O$ with a soln. of chromic anhydride, thus forming a colloidal black soln. of $Cr_2O_3.4CrO_3.nH_2O$ which is filtered and treated with an oxidizing agent such as Na perborate. Pb anodes and a temp. of 40° are used with a c. d. of 12–15 amp. per sq. dm.

Electrodeposition of chromium. E. Liebreich. Brit. 243,046, Aug. 13, 1924. The electrolyte is prepd. by melting CrO_3 contg. less than 1.2% of free H_2SO_4 and substantially no other impurities at a temp. at which O is given off and the material is reduced, *e. g.*, 170–200°, with exclusion of air and without excessive stirring and the heating is discontinued before excessive reduction causes the mass to solidify into an insol. product, and the mass is dissolved in H_2O when the reaction is completed. Gray

Cr deposits are obtained with a soln. contg. 0.6–0.8% free H_2SO_4 and a temp. of 40–50°. Bright deposits are obtained with an acid content of 0.8–1.2% and a temp. of 15°. Cf. *C. A.* **20,** 1360.

Electrodeposition of copper or other metals. M. M. Merritt. U. S. 1,601,690, Sept. 28. A conduit of sheet Pb or other insol. cond. material constitutes an anode and also serves to guide the electrolyte (which may be a soln. of $CuSO_4$ and H_2SO_4) in a swiftly moving continuous stream into contact with the cathode surface. U. S. 1,601,691 specifies increasing the metal content of an electrolyte such as acid $CuSO_4$ soln. by bringing the electrolyte into reactive contact with a controlled quantity of metal-bearing material, *e. g.*, sheet Cu scrap, sufficient to supply only the desired additional metal to the soln. U. S. 1,601,692 specifies a similar process in which both the quantity of metal-bearing material and the quantity of electrolyte brought into contact with it may be varied to effect control of the metal content of the electrolyte. U. S. 1,601,693 specifies temp. control of the electrolyte as a means of regulating the quantity of additional metal which it is to dissolve. U. S. 1,601,694 specifies the use of an oxidizing agent such as air to accelerate the dissolving action of the electrolyte on the metal.

Silver halides prepared electrolytically. S. E. Sheppard and R. H. Lambert. U. S. 1,602,595, Oct. 12. In electrolytically converting anode Ag into Ag halide in an aq. electrolyte such as KBr soln. which is a solvent for the Ag halide and contains heavy halide anions, the solvent power of the electrolyte is eventually reduced so as to ppt. Ag halide, *e. g.*, by diln. and cooling, and the ppt. is sepd. from the electrolyte.

Nickel. R. L. Suhl, J. W. Sands and O. B. J. Fraser. Can. 264,172, Sept. 7, 1926. Co-free electrolytic Ni is produced from Ni anodes contg. Co by adding hydrated Ni oxides to the electrolytic solns. to ppt. Co compds.

Electrolytic production of aluminum and its alloys. T. R. Haglund. Brit. 242,-958, Nov 5, 1924. A molten electrolyte for producing Al or its alloys is formed from cryst Al_2O_3 of high sp. gr. and amorphous Al_2O_3 of lower sp. gr. which may constitute 10–40% of the charge. The use of this mixt. is stated to minimize the formation of a solid crust on the molten bath.

Carbides. Gewerkschaft Wallram. Brit. 242,951, Nov. 14, 1924. Materials such as W, Mo, Ti, U, Cr, V, Si or B mixed with C may be introduced into a crucible formed as a cavity in the end of a C rod which is inserted in an elec. furnace within a C tube which forms the heating element of the furnace and after the material has been in the furnace for a sufficient time, after melting, to effect the desired change, it is removed and emptied into a mold. NH_3 or H or other neutral gas may be admitted to the furnace and catalysts also may be used.

Nitrogen oxides. J. S. Island. U. S. 1,601,500, Sept. 28. An elec. arc is produced with a com.-frequency current by the introduction of the high-frequency current into the circuit and a flow of air is directed through the zone of the arc.

Cleaning articles of non-ferrous metals. F. C. Schmutz. U. S. 1,601,511, Sept. 28. Articles formed of non-ferrous metals or alloys such as brass, Ni or Cu are subjected to electrolytic action in a soln. contg. a soap (*e. g.*, fish-oil soap) and a reagent of non-plating character, *e. g.*, NaCl, which lowers the sp. elec. resistance of H_2O and reduces foaming

Metal-coated materials for inductance coils or magnetic cores for transformers, etc. H. R. Deventer. Brit 243,139, Oct. 27, 1924. Fibrous material such as paper is coated by the Schoop process or otherwise with a continuous layer of Fe dust which may be deposited in an atm. of N, CO_2 or other medium which will prevent oxidation. A material of this or similar character is used for cores for transformers and for similar devices.

Heat treatment of manganese-steel castings. American Manganese Steel Co. Brit. 242,322, July 3, 1924. In heat-treating Mn steel castings as described in Brit. 206,183 (*C. A.* **18,** 1109), the castings are introduced into an elec. furnace which is at a relatively high temp. following the withdrawal of a completed charge of castings, with the heat supply cut off and the heat supply is left shut off for 15–30 min. until the temp. of the furnace has fallen to about 580–600°. Current is then supplied to raise the temp. to 1025° and is further regulated to complete the heat-treatment.

Electric heating of fused soda ash or other molten materials. C. T. Patterson. U. S. 1,601,703, Sept. 28. An elec. current is passed through the molten mass and the contact area of an electrode and the current supply are so proportioned as to supply the required heat and distribute it throughout the mass by movements set up in the material.

Electroplating apparatus. W. F. Hall. U. S. 1,601,528, Sept. 28.

Apparatus for electroplating wire in coiled bundles. J. A. PARKER. U. S. 1,601,-642, Sept. 28.

Electric furnace for treatment of comminuted carbonaceous materials. J. J. NAUGLE. U. S. 1,601,222, Sept. 28. A rotary, cylindrical, horizontal furnace contg. a plurality of movable electrodes (which also act as stirrers) is described, which is adapted for prepg. decolorizing C from residues of cooking liquor produced in the soda cellulose process.

Electric resistance furnace. SIEMENS-SCHUCKERTWERKE GES. Brit. 242,283, Nov. 1, 1924.

Thermostat for electrically heated ovens. BRITISH THOMSON-HOUSTON CO., LTD. Brit. 243,464, Sept. 6, 1924.

Changing mercury into gold. SIEMENS & HALSKE AKT.-GES. Brit. 243,670, Nov. 28, 1924. Hg is treated with spark discharges in a liquid dielectric such as paraffin oil. Cf. *C. A.* **20,** 714.

Mercury-vapor rectifiers. J. KÜBLER. U. S. 1,602,909–10, Oct. 12. Structural features.

Mercury-vapor rectifiers and similar devices. W. DÄLLENBACH. Brit. 243,378, Nov. 20, 1924. C_2H_2 may be admitted (through a passage in an electrode) into a Hg-vapor rectifier or the like where it decomposes and deposits on the anode fine C, which promotes cooling by radiation.

Mercury-vapor lamp. K MENSING. U. S 1,602,238, Oct. 5.

Mercury-vapor lamp. J NISBET. U. S. 1,602,245, Oct. 5.

Electric incandescent lamps. A. S. CACHEMAILLE. Brit. 242,787, Nov. 12, 1924. Gas for filling a lamp is preliminarily treated with a "getter" such as diphenylamine, *p*-dibromobenzene, $C_{10}H_8$ or diphenyl and its higher homologs and derivs. or its amino compds. or their derivs. such as carbazole, *o*-aminodiphenyl, crystal violet and anthracene A mixed with 3–15% H may be used as a filling

Electric incandescent lamp bulbs coated with phenolic condensation products. GENERAL ELECTRIC CO., LTD. Brit. 242,937, Nov. 13, 1924.

Vacuum discharge electric lamps. D. M. MOORE. Brit. 242,647, Nov. 7, 1924. Electrodes of Mg or other metal are directly connected to leading-in wires and one of the electrode rods has a narrow axial hole to effect concn. of the negative glow and cause the lamp quickly to respond to voltage variations so that it is adapted for transmission of pictures by wire or radio. Ne, A and He may be used for filling the lamp. Various details are described.

Composite metal articles of desired coefficient of expansion. E. ROMANELLI. U. S. 1,601,982, Oct. 5. Metal articles such as lead-in wires for elec. lamps formed with a core of one metal, *e. g*, Ni steel, are electroplated with another metal such as Cu to give the composite body a desired coeff. of expansion.

Tungsten filaments. W. B. GERO. U. S. 1,602,526, Oct. 12. W oxide free from compds. deleteriously affecting desired crystal structure is mixed with $LiNO_3$, NaOH, KOH or other compds. contg. alkali and alk. earth metals capable of promoting a structure consisting of crystals or grains fairly regular in shape and size, the W is reduced to metal, and the material is sintered and worked to filament size. U S. 1,602,527 also specifies mixing W oxide with compds. such as $LiNO_3$ or $CsNO_3$ and then reducing in H to prep. a W powder

Tungsten filaments. W. B. GERO. U. S. 1,602,525, Oct. 12. In order to prep. W for filaments of such structure as to resist offsetting and sagging at high temps., a W oxide free from substances deleteriously affecting grain growth is mixed with KNO_3 or other alk. earth or alkali metal salt promoting a definite grain or crystal structure in the filament when annealed or burned, and the W is reduced by H.

5—PHOTOGRAPHY

C. E. K. MEES

Stopping and catalyzing photographic processes. A. STEIGMANN. *Chem.-Ztg.* **50,** 672–3(1926).—The action of dyes and other desensitizers and sensitizers is discussed from the standpoint of adsorption. The photochem. and other characteristics of the Ag halide grains are considered to be altered by the formation of adsorption complexes which in some cases are reversible and in others are not. Examples are cited.

E. P. WIGHTMAN

Investigations on photographic developers. III. The effect of desensitizing in development. M. L. DUNDON AND J. I. CRABTREE. *Am. Phot.* **20,** 378–83; 438–43;

Am. Cinemat **7,** 10 *et seq.; Brit. J. Phot.* **73,** 404 *et seq.; Sci. ind. phot.* **6A,** 68–71, 77–83, 92–93(1926).—The relation of the spectral sensitivity of the eye and of film to various safe lights is shown graphically. Desensitizers permit greater visibility during development and prevent aerial oxidation fog. Phenosafranine, pinakryptol green, pinakryptol yellow, basic scarlet *N*, and aurantia were studied. Most desensitizers are more effective in a developer than in H_2O soln. and the effectiveness is approx. proportional to concn. With pinakryptol green, which was studied in detail, the fogging action and influence on rate of development vary with different developers. The latent image on a desensitized non-color sensitive film before development is bleached out by exposure to red light. The limits of safety in the use of various safe lights with Eastman panchromatic and negative motion picture film before and after desensitizing are given. Desensitizing is most useful with panchromatic film, in which case the color sensitivity is largely removed. M. L. DUNDON

Metoquinone developer. A. HÜBL. *Phot. Korr.* **62,** 1–4(1926).—A developer contg. 2 mols. of metol and 1 mol. of hydroquinol is made identical to one contg. an equiv. amt. of metoquinone by adding caustic soda equiv. to the H_2SO_4 combined with the metol, or double the equiv. amt. of Na_2CO_3 or K_2CO_3. Metoquinone dissociates into its components in soln. A metoquinol developer without alkali is, in effect, a metol developer. The hydroquinol is inactive unless alkali be added. The time of first appearance of the image changes with the age of a metoquinone developer without alkali. M. W. SEYMOUR

Single-bath developing, fixing and toning. A. STEIGMANN. *Phot. Rund.* **63,** 36–7(1926).—An extra-hard gaslight paper is exposed $1^1/_2$ times normal and treated with the following single bath soln. diluted with 2 or 3 vol. of H_2O: Hypo 600 g., KI 1.6 g., H_2O, 900 cc. To this is added: $AgNO_3$ 6 6 g., KBr 4.7 g., H_2O 1 l. $Na_2S_2O_4$ (0.5%) is added just before use. After a 2 min. immersion in the bath, the paper is exposed in sunlight until a yellow image appears. 5 cc. of a soln. composed of equal parts of concd. HCHO and concd. HCl soln. is added to the above bath and the print re-immersed till the image becomes a reddish brown. After washing and during drying the color changes to purple or brown. G. E. MATTHEWS

Warm-tone development and high-key prints. A. STEIGMANN. *Camera* (Luzern) **5,** 33–6(1926).—Three formulas for warm-tone development of prints are reproduced. The warmth of tone is increased by thiocarbamide in the fixing bath. For high-key prints, a bromided amidol developer, or a hydroquinol developer contg. hypo, may be used. Physical developers are also recommended for high-key work. M. W. S.

Gold, platinum and palladium toning baths. C. STÜRENBERG. *Schweiz. Photo-Ztg.* **28,** 242–4(1926).—Permanent black and brown images on paper result from fully toning with Pt and Pd. Au images are less permanent. The formulas are as follows: *Au and Pt toning bath*.—Distd., or rain H_2O, 500 cc.; citric acid, 5 g.; NaCl, 5 g.; potassium chloroplatinate, 5 g.; $AuCl_3$ (1% soln), 25–50 cc. A toning-fixing bath can be prepd. by mixing equal parts of the toning bath and a 20% soln. of hypo. It is best to introduce the Au and Pt just previous to use because the mixed bath does not keep well. For Pd toning the following bath is used after a preliminary treatment in dil. NaCl soln.: H_2O, 1 l.; NaCl, 5 g.; citric acid, 5 g.; $PdCl_2$, 0.5 g. The brown and brown-black color can be varied to sepia by further diln. Toning is followed by fixation in plain 10% hypo. C. IVES

Photochemical toning by sulfurization. ROHEN. *Photographe* **13,** 198–9(1926).—An intensified sepia image is produced by bleaching a fully developed image (on paper) in ferricyanide-bromide soln., exposing to strong light until the image prints out partially and then toning in dil. Na_2S soln. Unless intensification is required the print should be made a little weak. C. IVES

Staining properties of motion picture developers. J. I. CRABTREE AND M. L. DUNDON. *Sci. ind. phot.* **6A,** 84–6, 93–5; *Trans. Soc. Mot. Pict. Eng.* No. **25,** 108–16(1926).—In developing positive motion picture film by the rack and tank systems it is frequently necessary to discard an otherwise satisfactory developer because of the formation of stain. This stain is usually in the nature of dichroic fog having metallic silvery appearance, and is not oxidation stain, since the quantity of sulfite in the av. elon-hydroquinol developer is sufficient to prevent the accumulation of stain in oxidation products. It has been shown that the Ag stain is a result of the presence of both hypo and Na_2S in the developer. Hypo accumulates as a result of insufficient washing of the racks after fixing, while the Na_2S is formed by the reduction of the Na_2SO_3 and hypo present in the developer by bacteria or fungi. The remedy consists in using waterproof racks to prevent the transference of hypo, and in sterilizing the tanks before filling with developer. M. L. DUNDON

...stry of the bromoil process. M. SCHEIL. *Phot. Rund.* **63**, 55–6(1926).—Eder's ...ry of the cause of tanning in the bromoil process is criticized and S. advances an oxidation theory which is claimed to fit the more practical facts better. Gelatin immersed in a soln. of $KMnO_4$ causes the soln. to turn brown, forming O and MnO_2. If the gelatin so treated is placed in warm H_2O it will be hardened, showing the gelatin is oxidized. G. E. MATTHEWS

Bleach-out process with dyes, and its significance for silver-salt photography. A. STEIGMANN. *Phot. Korr.* **62**, 9–13(1926).—A theory of the action of org. sensitizers is offered, which explains both the bleach-out reaction and photography by means of Ag salts. In the bleach-out process, the dye absorbs energy which activates labile H atoms of sensitizers present in the gelatin. This H then reduces the dye to the leuco compd. Smith found that thioureas were good sensitizers for this reaction. Sheppard later isolated the thioureas from photographic gelatin, employed them to increase the white-light sensitiveness of Ag halides, and established the theory that they sensitized by forming Ag_2S specks S says that in Ag salt photography the latent image is formed by reduction of the Ag salt by activated H from the sensitizers in the gelatin. These cannot be thioureas, since these would already have reacted with the Ag halide in the dark, but rather disulfides of the type of cystine. The Ag_2S specks on the Ag halide grains, promote the activation of H so that the sensitivity centers are easily reduced to Ag. The theories of Sheppard and S thus agree. In the optical sensitizing of Ag halides by means of dyes, only a portion of the active H is used in reducing the dye, and the remainder is used in reducing the Ag halide. In the absence of sensitizing dyes, Ag salts and photohalides are capable of activating H atoms. Desensitization occurs when the activating dye uses up all the active H itself The fact that leuco bases are sensitizers, but not desensitizers, supports this view. S.'s theory is supported by expt. in which he produced latent images in methylene blue in photographically good gelatin. These could be detected by converting them into latent images in Ag salts. The dye is reduced to its leuco compd which is a reducing agent. M. W. SEYMOUR

Fading of printing-out papers and its prevention. F. FORMSTECHER. *Camera* (Luzern) **5**, 39–40(1926) —Printing-out papers give less permanent prints than bromide papers for the following reasons: (1) The Ag in printing-out papers is the more finely divided. (2) The Ag of bromide papers with their comparatively thick gelatin coatings is better protected from the atm than the Ag of collodion papers with their thin collodion coatings, or of mat albumin papers with almost no protecting layer. (3) Chemicals are more easily washed out from gelatin coated papers than from collodion or albumin papers. Print-out pictures from contrasty negatives keep better than those from soft negatives, since the Ag deposit is deeper in the former. Print-out pictures that turn yellow are usually contaminated with hypo. M. W. SEYMOUR

Use of gas-light papers in luminography. L. VANINO AND A. MENZEL. *Chem.-Ztg.* **50**, 651–2(1926); cf *C. A.* **19**, 2787.—Prints may be made on fast bromide papers by about 1 min. exposure to a phosphorescent plate in contact with the negative. V. and M. state that the intensity of the light source is always the same whether it is activated by daylight or Mg light. Negatives of printed matter may be made by placing the bromide paper in contact with the page, and the phosphorescent plate in contact with the back of the bromide paper. The bromide paper may also be placed under the printed page and the phosphorescent plate above the page. M. W. S.

Direct positives by the use of copper chloride. L. TRANCHANT. *Schweiz. Photo-Ztg.* **28**, 2402(1926).—A reversal positive is produced on bromide paper by bleaching the strongly developed negative image with $CuCl_2$, and the resulting AgCl is dissolved in NH_3 after being washed. The remaining AgBr is developed in strong light to a positive image. The solns are· *Bleach.* H_2O, 100 cc.; NaCl, 5 g.; $CuSO_4$, 3 g. *NH_3 soln.* H_2O, 70 cc., com. NH_3 water, 20 cc. C. IVES

The relation between time and intensity in photographic exposure. IV. L. A. JONES AND V. C. HALL. *J. Opt. Soc. Am.* **13**, 443–63(1926); cf. *C. A.* **19**, 3435.—Further results of the study of the reciprocal relation between the time of exposure and the intensity of exposing radiation are given. It has been found that the max. density obtainable with complete development is dependent upon the intensity used in making the exposure. This indicates that for the Ag halide grains there is an intensity threshold below which developability cannot be produced no matter how long the exposure time is prolonged. It has also been found that if the exposing intensity be sufficiently high all of the Ag halide present in the emulsion is made developable. V. C. HALL

Desensitizing. L. GORINI AND A. DANSI. *Riv. fot. ital.* **10**, 85–90(1925); *Chimie et industrie* **16**, 88(1926).—Highly sensitive plates were immersed in 0.005% solns.

of the chief desensitizers, and particularly in solns. of two safranines obtained by Beretta, one of which contained a substituted NH_2 in each of the 3 benzene rings, and the other contained an additional NH_2 substituted in one of the two symmetrical rings. They both had desensitizing properties intermediate between those of phenosafranine and of naphthosafranine. G. and D. found tolusafranine to be a better desensitizer than phenosafranine; but they confirmed the lack of desensitizing properties of safranol.
A. PAPINEAU-COUTURE

Mechanism of optical sensitizing. II. Water as a sensitizer. G. KÖGEL AND A. STEIGMANN. *Z. wiss. Phot.* **24,** 171–6(1926); cf. *C. A.* **20,** 1035, 1763.—The photographic dehydrogenation-hydrogenation theory of K. and S. is applied to explain the action of H_2O as a sensitizer. A. P. H. TRIVELLI

Mechanism of optical sensitizing and desensitizing. H. H. SCHMIDT. *Z. wiss. Phot.* **24,** 223–7(1926).—S. describes some expts. which show that the theory of Kögel and Steigmann is very improbable and states that the accelerated bleaching of dyes through AgCl is due to quanta absorption by the Ag halide and the transmission of this energy to the dye. A. P. H. TRIVELLI

Colloidal aurous oxide. A. STEIGMANN. *Chem.-Ztg.* **50,** 595(1926).—By dissolving a Ag-Au alloy in aqua regia, and neutralizing the soln. with Na_2CO_3, a bright blue soln. of colloidal aurous oxide was obtained. It failed to give the blue-violet ppt., or the brownish fluorescence in soln. that is described in the literature as being characteristic of colloidal aurous oxide. Acidification with HCl gave the yellow color characteristic of Au ions. Na_2CO_3, added to the acid soln., gave a green color which slowly reverted to blue. S. is at a loss to explain these color changes, since they are not to be expected of colloidal aurous oxide Dissolving the pure "Au salt" of photographers in aqua regia, evapg. the soln., and neutralizing it with Na_2CO_3, failed to give the blue soln. Hence, the formation of aurous oxide must depend upon the formation of aurous chloride, which is more easily formed by dissolving alloys than by dissolving pure Au. NaOH decolorized the blue soln., while NH_3 deepened its color. The colloidal nature of the blue soln. was inferred from its inability to tone sulfided photographic prints, from the slowness of its diffusion, and from the irreversible change brought about by evapn. on the H_2O bath. Pptg. $PbCO_3$ or $CaCO_3$ in the blue soln. decolorized it. M. W. SEYMOUR

Photographic process. M. C. BEEBE and A. MURRAY. Can. 263,645, Aug. 17 1926. An asphaltum photographic process consists in combining a selected asphaltum with a colloidal halide, subjecting the same to a luminous image, and in subsequently developing the print by means of a suitable solvent to remove variable sol. parts of the impressed image.

Photographic process. M. C. BEEBE, A. MURRAY and H. V. HERLINGER. Can. 263,643. Aug. 17, 1926. A synthetic resinous compd. is preliminarily formed which is capable of condensation under the action of light. It is subjected to the selective action of light in accordance with a luminous image.

Photographic process. M. C. BEEBE and A. MURRAY. Can. 263,644, Aug. 17, 1926. A photographic medium is prepd. by combining a solvent medium comprising benzene and solvent naphtha with an artificial hydrophobic colloid capable of transformation by the selective action of light.

Photographic process. M. C. BEEBE, A. MURRAY and H. V. HERLINGER. Can. 263,642. Aug. 17, 1926. A photographic process comprises acting selectively with light in accordance with an image, design or character upon a resinous compd. derived from an amine and a five-membered monoheterocyclic compd.

Photographic process. M. C. BEEBE, A. MURRAY and H. V. HERLINGER. Can. 263,647. Aug. 17, 1926. The process consists in photographically forming an image, which embodies a resinous product of a five-membered monoheterocyclic compd.

Photographic process. M. C. BEEBE, A. MURRAY and H. V. HERLINGER. Can. 263,646, Aug. 17, 1926. A photographic medium comprises a phenolic condensation product and a sensitizer which comprises a halogen source.

Photographic "reflection" process. AKT.-GES. FÜR ANILIN FABRIKATION. Brit. 243,023, Nov. 14, 1924. In carrying out the "reflection" process in which a more or less transparent sensitized material is exposed in contact with an original to light passing through the sensitized layer, the treatment which follows the exposure is confined to the surface of the sensitive layer. With such treatment, the thickness of the sensitive layer may be varied within wider limits, *e. g.,* 0.001–0.100 mm. or more. Numerous details are specified.

Photographic reliefs, etc. S. DE PROCOUDINE GORSKY and N. POZNIAKOW. Brit. 243,338, Nov. 19, 1924. In producing photographic reliefs and the like, gelatin is

rendered insol. by forming an emulsion of a Ag haloide in gelatin and reducing the haloide completely or partially, as by exposure to light and development. Details of formulas, temps. of treatment, etc., are given.

Photographic multi-color film material. K. CAMPBELL. Brit. 242,727, Aug. 20, 1924. A multi-color screen material for coating upon sensitized plates or films is produced by bleaching fine spores or pollen such as that of *L. clavatum*, dyeing equal quantities in 3 primary colors, mixing these when dry, and emulsifying the mixt. with gelatin or celluloid soln.

Photographic emulsion containing mercury. S. E. SHEPPARD and J. H. HUDSON. U. S. 1,602,589, Oct. 12. Gelatin or other suitable colloid is assocd. with a photographically sensitive Hg compd. such as Hg iodide and with another substance such as thiosinamine or a similar compd which enhances the sensitiveness to light.

Increasing sensitiveness of photographic compositions. S. E. SHEPPARD. U. S. 1,602,590, Oct 12. In order to increase the light-sensitiveness of photographic gelatino Ag halide emulsions without increasing their grain size, they are treated with a sterol-contg fraction of a biochem ext such as that from plant material dissolved in ligroin.

Photographic "developing-out" emulsion. S. E. SHEPPARD. U. S. 1,602,591, Oct 12 A colloid such as gelatin contg a photographic Ag salt is assocd. with a compd. such as tellurocarbamide or other similar Te compd. which increases the light-sensitiveness of the compn. U S 1,602,592 specifies the similar use of allylselenourea or other suitable Se compd instead of a Te compd.

Light filter system for color cinematography. C. H. FRIESE-GREENE. U. S. 1,601,616, Sept. 28.

6—INORGANIC CHEMISTRY

A. R MIDDLETON

The coördination valence of two hydroxyl groups in *o*-position. II. Complexes of hydroxyhydroquinol, of 1,2-dihydroxynaphthalene and of protocatechu-aldehyde with acids of the molybdenum group. L. FERNANDES. *Gazz. chim. ital.* **56**, 416–24 (1926) —In continuation of previous expts. (*C. A.* **20**, 556), further complexes were prepd and the compn is explained as before by the aid of coordination formulas. To identify those compds which could not be isolated readily in cryst. form, resort was had to the fact that both the tungstate or molybdate solns. and the solns. of the org. compds. were practically colorless and had no visible absorption spectra, while solns. of the resultant complexes were intensely colored, with characteristic spectra. Therefore by mixing the reagents in varying proportions and constructing diagrams showing the absorption as a function of the relative concns. of the reagents, the complexes formed were distinguished by max. absorption points on the curves. The technic of this method is described in detail. With its aid or by isolating the products in cryst. form where possible, the following compds. were prepd.: Aq. $(NH_4)_2MoO_4$ and hydroxyhydroquinol (I) gave by the spectrographic method the *compds.* $MoO_3.C_6H_6O_3.(NH_4)_2O.nH_2O$ and $MoO_3.2C_6H_6O_3.(NH_4)_2O.nH_2O$. Similarly $(NH_4)_2MoO_4$ and 1,2-$C_{10}H_6(OH)_2$ (II) gave the *compds.* $MoO_3.C_{10}H_8O_2.(NH_4)_2O.nH_2O$ and $MoO_3.2C_{10}H_8O_2.(NH_4)_2O.nH_2O$ and $(NH_4)_2WO_4$ and I gave the *compds.* $WO_3.C_6H_6O_3.(NH_4)_2O.nH_2O$ and $WO_3.2C_6H_6O_3.(NH_4)_2O.nH_2O$. Uranyl sulfate, I and hot C_5H_5N gave a cryst. ppt. of *pyridine hydroxyhydroquinol aquouranate*, $UO_3\begin{bmatrix}C_6H_6O_3\\H_2O\end{bmatrix}\begin{matrix}C_5H_5NH\\H\end{matrix}$ maroon. In a similar way was obtained cryst. *pyridine 1,2-dihydroxynaphthalene aquouranate*, $[(UO_3)(C_{10}H_6O_2)(H_2O)](C_5H_5NH)H$, brick-red. Complexes contg. 2 mols. of the org. OH compd. could not be prepd., for on addn. of C_5H_5N to solns. contg. uranyl salts with excess I or II, red sirupy liquids were obtained which could not be crystd Agitation of protocatechualdehyde (III) with excess aq. $(NH_4)_2MoO_4$ gave on cooling cryst. *ammonium protocatechualdehyde aquomolybdate*, $[(MoO_3)(OHCC_6H_3O_2)(H_2O)](NH_4)H$ (IV), orange With excess **III** was formed cryst. *ammonium diprotocatechualdehyde molybdate*, $[(MoO_2)(OHCC_6H_3O_2)_2](NH_4)H$, maroon. **III** and boiling aq guanidine molybdate pptd. on cooling cryst. *guanidine diprotocatechualdehyde molybdate*, $[(MoO_2)(OHCC_6H_3O_2)_2][C(:NH)(NH_2)_2]_2$, brick-red, does not decomp. at 160°, sol. in boiling H_2O, and practically insol in cold H_2O, EtOH and Et_2O. **IV** boiled with $ThNO_3$, and filtered, pptd from the filtrate *thallium protocatechualdehyde aquomolybdate*, $[(MoO_3)(OHCC_6H_3O_2)(H_2O)]TlH$, red. Aq. $(NH_4)_2WO_4$ and **III**

(equimol. wts.) pptd. cryst. *ammonium protocatechualdehyde aquotungstate,* $[(WO_3)(OHCC_6H_3O_2)(H_2O)](NH_4)_2$, insol. in EtOH and in Et_2O. Under the same conditions, but with excess **III**, was formed *ammonium diprotocatechualdehyde tungstate,* $[WO_2(OHCC_6H_3O_2)_2](NH_4)_2$, violet, insol. in EtOH and in Et_2O. C. C. DAVIS

A heterogeneous lead complex, iodothiocyanate. A. C. VOURNAZOS. *Z. anorg. allgem. Chem.* **155,** 241–6(1926).—V. prepd. and examd. the K, Na and NH_4 iodothiocyanate compds:, $K_4[PbI_2(SCN)_4].2H_2O$, Na same as K, and $(NH_4)_8[PbI_2(SCN)_8]\cdot 2H_2O$. They are unstable in air, decomposed by H_2O, slightly sol. in $(CH_3)_2CO$ in which they are prepd., and can be electrolyzed in this medium. The Cl, Br and F binary compds. are slightly sol. in $(CH_3)_2CO$ and show no marked tendency to form complex addition compds. Org. thiocyanates form addition compds., very sol. in $(CH_3)_2CO$, insol. in H_2O and stable in air: $PbI_2C_6H_5NH_2HSCN$, and $PbI_2CH_5N_3HSCN$. C. E. P. JEFFREYS

The formation of normal uranates by heating UO_3 with metallic oxides. G. TAMMANN AND W. ROSENTHAL. *Z. anorg. allgem. Chem.* **156,** 20–6(1926).—Normal uranates were prepd. by heating UO_3 with the oxides of Li, Ag, Ca, Ba, Sr, Mg, Zn, Cd, Hg, Cu, Pb, Co, Mn, Ni, Al, Cr, Fe and V. Reactions did not occur with the oxide of Be, Ce or Mo. The mixts. were heated to a temp. not exceeding 670° for two 10-min. periods and the products analyzed. Heating above 670° caused admixt. of lower oxides of U. R. W. RYAN

Iridium halides. F. KRAUSS AND H. GERLACH. *Z. anorg. allgem. Chem.* **147,** 265–87(1925).—The field was reviewed experimentally. A number of new compds. were prepd.; others previously reported could not be duplicated. Metallic Ir or $Ir(OH)_4$ was treated with halogen or hydrohalogen acid at various temps. and in the presence of CO, $COCl_2$ or light (sun or burning Mg). $Ir(OH)_4$ is more reactive than Ir. Action of halogen is greatly hastened by CO, $COCl_2$ and light. Hydrohalogen acids react with $Ir(OH)_4$ at lower temps. than do free halogens, the free energy of the reactions increasing from HCl to HI. The following new compds. are reported: $\left[IrCl_2{}^{OH}_{OH_2}\right]2H_2O$; $\left[IrCl_2{}^{OH}_{OH_2}\right]$; $\left[IrCl_2{}^{OH}_{OH}\right]H$ (in solution); $[IrCl_3OH_2]$; $\left[IrBr_2{}^{OH}_{OH_2}\right]\cdot 2H_2O$; $\left[IrBr_2{}^{OH}_{OH_2}\right]$; $\left[IrBr_2{}^{OH}_{OH}\right]H$ (in soln.); $[IrBr_3OH_2]$; $IrBr_3$; $IrBr_2$; IrBr; $[IrI\text{-}OH_2]\ 2H_2O$; $[IrI_3OH_2]$; IrI_3; and IrI. R. A. BAKER

Optical and chemical investigation of the solutions of alkali halides and hydrogen halides. A. HANTZSCH. *Ber.* **59B,** 1096–1119(1926).—A comparative study of the absorption of light in the ultra-violet by the homogeneous H halides and alk. halides, and by their aq solns., indicates the existence in the solns. of *hydrates* and *hydrated ions* of various types. The H halides in aq. soln. form primarily hydroxonium salts, $X[H_3O]$; and the alkali halides form aquo-ions, $[X(H_2O)_n]^-$. The presence of SO_2 in the soln. increases the absorption of light by the formation of complex anions, $[(OH_2)_nX(SO_2)_m]^-$. The alkali salts of the oxy acids do not form such hydrated complexes, which difference is offered in explanation of certain chem. behavior peculiar to the alkali halides. Thus, in *neutral salt action,* the alkali halides catalyze the action of their corresponding acids in the splitting of diazoacetic ester, and in the sapon. of esters. This is attributed to the withdrawing of H_2O from the highly hydrated acid, owing to the formation of hydrates by the salt, thereby converting the acid into a less hydrated, more active form. The existence of definite hydrates in soln. is made probable by the fact that the max. sp. elec. cond. occurs in solns. where the ratio, mols. H_2O/mols. salt, is equal to the coördination no., 4, 6, or 8; *e. g.,* $NH_4NO_3 + 4H_2O$, $KSCN + 6H_2O$, $NaBr + 8H_2O$ and $NaI + 8H_2O$. The presence of hydrates in the solns. of the H halides is indicated by the practical insoly. of NaCl in $HCl + 4H_2O$; $HBr + 4H_2O$, cryoscopically; and by the const. boiling mixt., $HCl + 8H_2O$, at 110°, 760 mm. Such octahydrates are probably to be represented with 2 tetraaquo-ions, $[X(H_2O)_4][(H_2O)_4H]$. The approx. equal migration velocity of Cl^-, Br^-, I^- and ClO_4^- seems to have its basis in the halide ions having 4 coördination positions in the 1st sphere, which are occupied by 4 H_2O mols., $[X(H_2O)_4]^-$. R. H. LOMBARD

Borates and phosphates of the rare earths. G. CANNERI. *Gazz. chim. ital.* **56,** 460–4(1926).—Though the color reactions in borax beads and the cryst. forms in phosphate fusions of oxides of the rare earths have long been known, there are few data on the precise nature of the compds. formed (cf. *Bull. soc. chim.* **39,** i, 316(1883); Gmelin-Kraut, *Handbuch Anorg. Chemie,* 4th Ed., **2,** I, 534, 548, 563). Because of this and of the increasing importance of these rare metals, a study was made of the reactions between oxides of the rare earths and borax or $NaPO_3$, the concns. and conditions

the mixt. being varied. The compds. formed from the oxides and borax vary according to the relative proportions of oxide and borax. All were stable at ordinary temps. and were insol. in water and in dil. acids and so could be sepd from the fusion mixt. With very low concns. of oxide in the borax, the following compds. were obtained, all of the type $M_2B_6O_{12}$ (*i. e.*, M_2O_3 $3B_2O_3$): *$Ce_2B_6O_{12}$*, white; *$La_2B_6O_{12}$*, white; *$Nd_2B_6O_{12}$*, rose or flesh color; *$Pr_2B_6O_{12}$*, bright green; *$Y_2B_2O_{12}$*, white By addn. of more oxide to the fusion mixts. from which these were obtained though not to satn., the following *compds.* (M_2O_3 $2B_2O_3$) were obtained: *$Ce_2B_4O_9$*, white, *$La_2B_4O_9$*, white; *$Nd_2B_4O_9$*, rose or flesh color; *$Pr_2B_4O_9$*, bright green; *$Y_2B_4O_9$*, white. With enough oxide to reach the satn. point, the resulting glass became opaque through crystn. of the following *compds* (M_2O_3 B_2O_3), all of which were insol. in concd acids: *$Ce_2B_2O_6$*, white; *$La_2B_2O_6$*, white; *$Nd_2B_2O_6$*, violet-rose; *$Pr_2B_2O_6$*, green; *$Y_2B_2O_6$*, white. The *compds*. formed from the oxides and $NaPO_3$ were of 1 type, *viz.*, MPO_4, regardless of the relative concns.: *$CePO_4$*, white; *$LaPO_4$*, white; *$NdPO_4$*, violet-red; *$PrPO_4$*, green; *YPO_4*, white. All were insol. in dil and concd. acids The absence of Na in any compd. precluded the possibility of addn compds. with alk. metals C C. D.

The decomposition of double ammonium fluorides of elements of the titanium group. S. HARTMANN. *Z. anorg. allgem. Chem.* **155**, 355–7(1926). –Investigation of the decompn. of ammonium hexafluorides of Ti, Zr and Hf shows that the Hf compd. decomposes more easily than the Zr compd while the Ti salt is intermediate in this respect. In the case of the Ti salt, above 150° TiF_4 begins to distil. This behavior makes it possible to remove considerable quantities of Ti from the Zr compd.

A E RUARK

The oxidizing properties of sulfur dioxide. WM. WARDLAW. *J. Soc. Chem. Ind.* **45**, 210–14T(1926) —Although SO_2 is usually regarded as a reducing agent, some reactions in which it acts as an oxidizing agent have been known for many years, *e. g.*, with $SnCl_2$. The reaction of SO_2 with $FeCl_2$ and $FeCl_3$ in acid soln was studied and the percentage of Fe^{+++} at equil detd at 95°. The reaction is apparently reversible; but a high concn. of acid, at least 165 g per l, is necessary for SO_2 to act as an oxidizer. The highest percentage of the total Fe converted to Fe^{+++} was 8 9%. The phosphates of iron behave like the chlorides The effect of acid concn on the oxidizing properties of SO_2 is related to ionization into HSO_3^- and SO_3^{--} ions. The equil. between SO_2 and the Cu chlorides was also studied; and it appears that this reaction, as well as the reaction with the Hg chlorides, is reversible A W KENNEY

The reduction of chromium compounds by hydrogen under pressure and at raised temperatures. V. N. IPAT'EV AND B A. MOUROMTSEV. *Compt. rend.* **183**, 505 7 (1926) —Cr solns. were treated with H at 280-300° and 80–200 atm K_2CrO_4 acidified with H_2SO_4 under these conditions yields a compd whose analysis corresponds to the formula $K_2O.2Cr_2O_3$ $3SO_3$ H_2O. Similarly CrO_3 with H_2SO_4 yields $2Cr_2O_3$ $3SO_3$-$6H_2O$. Both are cryst. and insol in acids and alkalies Crystals obtained by reduction of acid solns. of a mixt of CrO_3 with $FeSO_4$ or $Fe_2(SO_4)_3$ show evidence of the formation of isomorphic Cr and Fe compds. J. E SNYDER

Isomorphic relations between samarium compounds and the corresponding compounds of strontium, barium and lead. G. CAROBBI. *Rend. accad. sci. fis. mat. Napoli* **31**, 83–94(1925) —*Samarium molybdate* was prepd by pptg. $Sm(NO_3)_3$ soln. with Na_2MoO_4 soln. The formula of the air-dried salt is $Sm_2(MoO_4)_3$ $15H_2O$; of that dried over concd. H_2SO_4, $Sm_2(MoO_4)_3.12H_2O$. Fusing the hydrates at 1100° gave anhydrous $Sm_2(MoO_4)_3$ as pale-yellow, tetragonal bipyramids, which are described crystallographically: $a.c = 1:1.5745$; $(111):(11\bar{1}) = 48°,22'$; $(111)\cdot(1\bar{1}1) = 80°,20'$. M. p. 1074°; d_{16}^{16} 5 36. In the molybdates of the Ce group there is no relation between the at. wt. of the rare earth and $a:c$. The d., mol. vol, and m p. of the molybdates of the Ce group are tabulated. The mol. vol. decreases regularly with increasing at. wt. of the rare earth, but the m. p. shows no regularity. $Sm_2(MoO_4)_3$ and $PbMoO_4$ (m. 1065°), after being melted together, show complete miscibility in the solid state. Mixed crystals of $CaMoO_4$ and $Sm_2(MoO_4)_3$ were obtained by crystn. from a NaCl fusion. They are mutually sol. in the solid state up to about 68 2% $Sm_2(MoO_4)_3$. Similarly, $SrMoO_4$ and $Sm_2(MoO_4)_3$ are mutually sol. in the solid state to the extent of 46.56% $Sm_2(MoO_4)_3$. The prepn. of *$SmPO_4.2H_2O$* is described. A *chlorapatite*, $Ca_3(PO_4)_2.SmPO_4.CaCl_2$, contg. 13 6% $SmPO_4$, was prepd. by fusing together at 1100° a mixt. of 0.5126 g. $SmPO_4$, 3 g. $Ca_3(PO_4)_2$ and 6 g. $CaCl_2$, followed by lixiviation with H_2O. It formed small crystals combining the hexagonal prism $(10\bar{1}0)$ with the bipyramid $(10\bar{1}1)$, of weak birefringence, and uniaxial negative. Other elements of the Ce group do not occur in such large % in the chlorapatites, which is in accord with the greater soly., in the solid state, of $Sm_2(MoO_4)_3$ in $CaMoO_4$, as compared with the

other molybdates of the Ce group. C.'s results together with data by Zambonini (*C. A.* **18**, 947) show that the isomorphism of Sm toward the metals of the isomorphogenic Ca group is more pronounced than that of the other metals of the Ce group. This is in accord with the occasional bivalence of Sm as in $SmCl_2$ and SmI_2.

R. H. LOMBARD

Varying valency of platinum with respect to mercaptanic radicals. III. P. C. RÂY, B. C. GUHA AND K. C. BOSE-RÂY. *Quart. J. Indian Chem. Soc.* **3**, 155–60(1926); cf. *C. A.* **20**, 1569.—The action of NH_3 on 4 isomeric varieties of $PtCl_2 \cdot 2Et_2S$, m. resp. 96°, 104°, 108°, 110°, gave $PtCl_2 \cdot 4NH_3$. Pyridine acting on $PtCl_2 \cdot 2Et_2S$, m. 77°, gave $PtCl_2 \cdot 2C_5H_5N$ in a hot soln. In the cold $PtCl_2 \cdot 4C_5H_5N$ was obtained. NH_3 combines with $PtCl_3 \cdot 2Et_2S$ and $PtCl_4 \cdot 2Et_2S$ to form $PtCl_2 \cdot 4NH_3$. C_5H_5N combines with $PtCl_4 \cdot 2Et_2S$ to form $PtCl_4 \cdot 2C_5H_5N$. These products are well known compds. of the Werner type and are directly corroborative of the Werner constitution.

R. C. ROBERTS

The chemistry of nitrosyl chloride. E. V. LYNN AND H. A. SHOEMAKER. *J. Am. Pharm. Assoc.* **15**, 174–8(1926).—A review of the literature with bibliography preparatory to an investigation.

L. E. WARREN

Sulfurous acid and its salts. III. The action of sulfurous acid on thiosulfuric acid. F. FOERSTER AND R. VOGEL. *Z. angew. allgem. Chem.* **155**, 161–91(1926).—When $H_2S_2O_3$ solns. were treated with H_2SO_3 there are established the equil. (1) $S_2O_3^{--} + H^+ \rightleftharpoons HS_2O_3^-$; (2) $HS_2O_3^- \rightleftharpoons HSO_3^- + S$; (3) $S_2O_3^{--} + H^+ \rightleftharpoons HSO_3^- + S$, and (4) $H^+ + HSO_3^{--} \rightleftharpoons H_2SO_3 \rightleftharpoons SO_2 + H_2O$. This last inclines toward the right, and a dark yellow color develops in the soln. due, according to Debus, to colloidal S, but it was found here due to a complex compd. as described in *C. A.* **17**, 1598. Two salts of this compd., $K_2S_2O_3.SO_2$ and $Rb_2S_2O_3.SO_2$ were prepd. While equil. (4) exists, the SO_2 goes partly into equil. with $S_2O_3^{--}$ to form the complex giving the yellow color, and the concn. of the latter is consequently lessened and less S is deposited than in equil. (3) This is the case when the ratio H_2SO_3 to $H_2S_2O_3$ is greater than 1. The smaller the concn. of thiosulfate the more of the complex ion exists and the longer the soln. will remain clear. Slowly such a soln. does change with formation of polythionates. In the presence of excess H_2SO_3, penta- and trithionates are formed with the pentathionate breaking down to the tetra- the tetra- to the tri-, and this finally partly back to thiosulfate. There is a mixt. of all these ions in the soln. for a time, then $S_2O_3^{--}$ goes to HSO_3^- and S, and some trithionate goes to sulfate and $S_2O_3^{--}$ and so on. Finally all acidified thiosulfate solns. contain only sulfate, S, and H_2SO_3. An equil. const. was detd. by studying the shift of the equil., $S_2O_3^{--} + H^+ \rightleftharpoons HSO_3^- + S$, for this key reaction. It was calcd. to be at 11° $c_{S_2O_3^{--}}.c_{H^+}/c_{HSO_3^-} = K\ 1.3 \times 10^{-2}$.

C. E. P. JEFFREYS

Action of α-picoline on the alkaline iridohexachlorides. Study of the complex iridium compounds thus produced. M. GUILLOT. *Bull. soc. chem.* **39**, 852–64(1926).—α-Picolinium iridohexachloride, $[IrCl_6](\alpha PicH)_3$, was made from α-picoline-HCl and $IrCl_6Na_3$. *Picolinium iridomono-α-picolinopentachloride*, $[Ir(\alpha\text{-}Pic)Cl_5](\alpha\text{-}PicH)_2$, was prepd. by treating picoline hydrate with iridodipicolinoaquotrichloride in HCl. The *Ag salt*, $[Ir(\alpha\text{-}Pic)Cl_5]Ag_2$, and *Tl salt*, $[Ir(\alpha\text{-}Pic)Cl_5]Tl_2$, were prepd. Other complex compds. represented by the formulas $\left[(IrCl_7)_3(\alpha\text{-}Pic)\right]^{(\alpha\text{-}PicH)_3}_{(NH_4)_9}$ and $\left[(IrCl_7)_3(\alpha\text{-}Pic)\right]^{(\alpha\text{-}PicH)_3}_{(K_9)}$ were obtained from the mother liquor. *Iridodipicolinoaquotrichloride*, $[Ir(\alpha\text{-}Pic)_2H_2O\ Cl_3]$, was obtained by treating $IrCl_6(NH_4)_3.H_2O$ with α-picoline in HCl. Alk. iridohexa chloride and α-picoline gave *iridotripicolinotrichloride*, $[Ir(\alpha\text{-}Pic)_3Cl_3]$. Unsuccessful attempts to prep. a tetrapicoline compd. similar to these were made.

R. C. ROBERTS

The crystal structure of cubic telluric acid (KIRKPATRICK, PAULING) 2. Crystal structure and chemical constitution of basic beryllium acetate and its homologs (MORGAN, ASTBURY) 2. Action of metals on HNO_3 (JOSS) 2.

7—ANALYTICAL CHEMISTRY

WILLIAM T. HALL

A new method of general analytical procedure; centrifuge-volumetric analysis. ROBT. F. LE GUYON. *Compt. rend.* **183**, 361–3(1926).—Many reactions can be made the basis of titration methods if a suitable way of detg. the end point can be detd.

Thus the Gay-Lussac method of titrating Ag solns. uses as the end point the mean between the end of the apparent pptn. by NaCl and of the subsequent pptn. by $AgNO_3$. In such titrations, it is sometimes helpful to clarify the soln with the aid of the centrifuge before deciding that the pptn. is complete. W. T. H.

Quantitative analysis by means of x-rays. E. DELAUNEY. *Bull. soc. chim.* **39,** 805–19(1926).—The use of x-rays in quant. analysis is described in detail (cf. *C. A.* **19,** 2462) and the application of x-rays for detecting inclusions in iron and steel is also mentioned. W. T. H.

The destruction of filters with oxidizing agents applied alternately in quantitative analysis. RAOUL POGGI AND ANGIOLO POLVERINI. *Atti accad. Lincei* [6] **4,** 55–7 (1926).—For the ignition of ppts. such as $MgNH_4PO_4$ or $MgNH_4AsO_4$ which are likely to be reduced by hot carbonaceous material, it is recommended to sep. the ppt. from the filter paper and heat the latter with 3-4 cc. of concd HNO_3, evap to dryness, add 5-6 cc. of 15% H_2O_2 and repeat these treatments until all paper is destroyed. Porcelain crucibles are preferred to Pt ones because Pt catalytically decomposes H_2O_2 C. C. DAVIS

Construction of stable colorimetric scales for measuring p_H values. P. BRUÈRE. *J. pharm. chim.* [8] **3,** 377–9(1926).—The scales of Clark and Lubs (*C. A.* **11,** 1443, 3288) are unstable because coloring matter is pptd. by electrolytes in the buffer solns. In the place of the bromothymol-blue scale (p_H = 7 0), B. builds a permanent series ranging in p_H from 6 0 to 7.6, by the use of the following 2 solns.: (*A*) $Co(NO_3)_2$ (20% soln.) 2 cc.; $K_2Cr_2O_7$ (0 03% soln) 98 cc. (*B*) $Co(NO_3)_2$ (20%) 5 cc.; $CuSO_4.5H_2O$ (10%) 95 cc. Soln. *A* corresponds to the tube indicating p_H = 6 0, soln. *B* to that for p_H = 7.6 in the C. and L. scale. The intermediate tints from yellow to blue, corresponding to p_H = 6 0, 6 2, 6.4, 6.6, 6 8, 7.0, 7.2, 7 4, 7 6, are supplied by 7 proportionally graded mixts. of *A* and *B*. This scale of 9 tubes enables rapid control of neutrality of H_2O, or urines, etc., when bromothymol blue is used as indicator. For comparable results, the liquids must be examd. at ordinary temp S WALDBOTT

The application of the thermal dissociation of the ammonium halides in quantitative analysis, and the theoretical interpretation of these processes. LUDWIG MOSER AND SIEGFRIED MARIAN. *Ber.* **59B,** 1335–44(1926).—In the Blangey method of detg $KClO_4$ (*Chem.-Ztg.* **43,** 691(1919)) this is reduced to KCl by fuming off a mixt of $KClO_4$ + NH_4Cl in the presence of H_2PtCl_6 as catalyst The use of NH_4Br or NH_4I instead of NH_4Cl obviates the necessity of the catalyst. Procedure: Fume off twice (40 min each) at 400–500° finely powd. $KClO_4$ (0.25 g) which is intimately mixed each time with 1.5–2 g. NH_4Br, using a quartz or porcelain crucible in an air bath. Convert the residual KBr to K_2SO_4 by evapn. with H_2SO_4, or to KCl with Cl_2 + H_2O, and weigh as such. Convert K_2SO_4 and Na_2SO_4 to KCl and NaCl, preliminary to the quant sepn. of K^+ from Na^+, as follows: Fume off 2 3 times (40 min. each) 0 25 g of the finely powd. salt which is mixed each time with 1.5 2 g of a mixt. of 4 parts by wt. NH_4Br + 1 part by wt. NH_4I; use a quartz or porcelain crucible covered with a perforated mica plate, and heat in an air bath Then convert to chloride by evapn. with Cl_2 + H_2O. Li_2SO_4 may be converted to LiCl likewise Convert the alkali nitrates quantitatively to the chlorides by fuming off once with NH_4Cl. The alkali arsenates and those of Sr and Ba can be freed from As by several fumings-off with NH_4Cl (Rose's method); but, for the decompn. of $Mg_2As_2O_7$, NH_4I or NH_4Br must be used: Fume off 1–3 times with a ten-fold amt. of NH_4I (1.5–2 g) at about 400° as above. Evap. the residue of MgO + MgI_2 with dil. H_2SO_4, gently ignite and weigh the $MgSO_4$. With NH_4Cl such H is not formed by the dissocn. of the HCl. H from the dissocn. of the NH_3, and the relatively greater dissocn. of NH_4Br and NH_4I are also contributing factors. R H. LOMBARD

Chloramine. P. N. VAN ECK. *Pharm. Weekblad* **63,** 1117–21(1926).—On account of its stability in aq. soln. and its strong oxidizing power, chloramine-T is recommended as a reagent for the detn. of HNO_2, SO_2 and As_2O_3. A. W. DOX

Compounds of diphenylthiocarbazone with metals and their use in analysis. H. FISCHER. *Wiss. Veröff. Siemens-Konz.* **4,** 158–70(1925); *Brit. Chem. Abstracts* **1926A,** 491.—Diphenylthiocarbazone (I) in alk. soln. gives red, brown, or purple ppts. with Zn, Cd, Cu, Ni, Co, Mn, Pb, Hg, Ag in NH_3 soln., but not with Fe, Al, Cr, Sn All the ppts. except with Hg^+ and Ag are sol. in CS_2. Sensitive tests for Zn and Cu are the color changes on adding to a CS_2 soln. of **I.** Mn and Pb which give colors similar to that given by Zn are distinguished by adding a Co salt which changes their colors but not that with Zn. Cu, Hg, Ag, Sn, Ba interfere with the test for Zn. Zn is detd. grav. by pptg. a soln. less than 0.5 g. Zn per l. in 25% AcOH with a 3% soln. of **I** in 10% NH_3, and igniting to ZnO. A. W. FRANCIS

Oxidimetric determinations by means of potassium permanganate. (Phosphorous and hypophosphorous acids and calcium hypophosphite.) L. Zivy. *Bull. soc. chim.* **39,** 496–500(1926).—Amat (*Compt. rend.* **111,** 676) and later Gailhat (*Bull. soc. chim.* **25,** 395) studied the detn. of H_3PO_2 and H_3PO_3 by means of $KMnO_4$ but their procedures do not always give concordant results. Careful tests, however, show that the method of G. slightly modified is capable of giving very satisfactory results. Take 50 cc. of 0.1 *N* $KMnO_4$, 25 cc. of 0.7 *M* $MnSO_4$ and 20 cc. of concd. H_2SO_4. Heat to boiling under a reflux condenser and add the soln to be oxidized. Heat about 25 min., cool to 45° and add sufficient 0.25 *N* oxalic acid to cause the disappearance of all color. Finally add 0.02 *N* $KMnO_4$ to a faint pink. W. T. H.

Analysis of gas mixtures containing the oxides of nitrogen. Edward Barnes. *J. Soc. Chem. Ind.* **45,** 259–62(1926).—The methods suitable for the analysis of a mixt. of N, N_2O, NO, N_2O_3 and NO_2 were studied. N_2O_3, if present, must be in equil with NO_2. In such a mixt. it seems best to absorb NO_2 first by allowing the gas to react for 1 min. with coarsely powd. NaOH. During this time the reaction between NaOH and NO is inappreciable and the absorption of NO_2 is complete. If NO is present in excess of NO_2, det. the nitrite resulting from the absorption by titrating with $KMnO_4$. If an excess of NO_2 is present, det. the total N by Devarda's method and the nitrite by $KMnO_4$ titration. After the removal of the NO_2, chill the gas by liquid air to condense the N_2O to a solid. Det. NO by means of $FeSO_4$ soln. or by alk. sulfite soln. which is satd. with N. W. T. H.

The action of stannous chloride on nitrous acid. F. Raschig. *Z. anorg. allgem. Chem.* **155,** 225–40(1926).—The action of $SnCl_2$ was observed and an attempt made to use it in a titrimetric detn. of HNO_2 and nitrites. A small excess of $SnCl_2$ was added to the nitrite and after the reaction the excess titrated with I_2 soln. The results, however, proved unsatisfactory partly because several reduction products are formed (*e. g.*, NH_4OH, N_2O, $H_2N_2O_4$, NH_2OH and N_2O) and partly because of the slow reduction of some of the intermediate products. C. E. P. Jeffreys

Colorimetric determination of the ferric ion, and some observations on the reaction. H. W. van Urk. *Pharm. Weekblad* **63,** 1101–7(1926).—Detn. of small amts. of Fe in battery acid (30% H_2SO_4) must necessarily be performed colorimetrically, and KSCN or $K_4Fe(CN)_6$ is usually employed. With either reagent the Fe^{++} must first be oxidized to Fe^{+++}, *e. g*, with $KMnO_4$ followed by H_2O_2, or better with $K_2S_2O_8$; HNO_3 does not give quant oxidation. The color reaction with KSCN is more delicate than that with $K_4Fe(CN)_6$ and the disturbing effect of the acid may be overcome by using a large excess of the reagent. Removal of H_2SO_4 and simultaneous oxidation of Fe^{++} may be accomplished by careful ignition after adding NH_4OH and $(NH_4)_2S_2O_8$. With the Prussian blue reaction the soln. must be allowed to stand 15 min. before comparison with the color standard. The red $Fe(SCN)_3$ may be shaken out with Et_2O but it is insol. in other org. solvents with the exception of AmOH. A. W. Dox

Method for the colorimetric determination of the ferric ion, applicable also to strongly acid solutions. H. W. van Urk. *Pharm. Weekblad* **63,** 1121–3(1926).—The color reaction with pyramidone is applicable to the detn. of Fe^{+++} in dil. acid soln. (H_2SO_4). At 0.1 *N* acid the color is dependent on the acid concn., but at 1.2 *N* and beyond this the concn. of acid has little influence. Good results are obtained with 0.05–0.3 mg. Fe^{+++} per 100 cc. The detn. is best performed with 1% pyramidone but lower concns. down to 0.1% may be used. A. W. Dox

The estimation of ferro- and ferricyanides. W. M. Cumming and William Good. *J. Chem. Soc.* **1926,** 1924–8.—Solns. of ferrocyanides on being treated with benzidine-HCl give ppts. of $3C_{12}H_{12}N_2 \, H_4Fe(CN)_6.H_2O$. Ferricyanides similarly ppt. $3C_{12}H_{12}N_2.H_3Fe(CN)_6.3H_2O$. For the gravimetric detn. take 0.2 g. of a sol. ferrocyanide, treat with a slight excess of benzidine-HCl soln., filter, dry and ignite to Fe_2O_3. Of an insol. ferrocyanide, dissolve 0.5 g. of sample in dil. NaOH, remove the metal in some suitable manner, neutralize with HCl using methyl orange as indicator and then treat as above. For the vol. detn. of a ferrocyanide, proceed similarly but in the filtrate titrate the acid present with NaOH using phenolphthalein as indicator. In the original benzidine soln. 2 mols. of HCl are combined with each mol. of benzidine and titrate against NaOH with phenolphthalein as if the HCl were uncombined. When 3 mols. of benzidine-HCl react with a neutral ferrocyanide, only 2 mols. of uncombined HCl remain so that the benzidine soln. loses in acidity when the pptn. takes place. The detn. of ferricyanide is the same in principle but a considerable excess of the reagent is necessary. W. T. H.

A color reaction for the differentiation between orthoarsenate and orthophosphate. Luis Rossi. *Quim. e ind.* **3,** 173–5(1926).—A vanadyl soln. (1 cc.) obtained by re-

duction of 1% metavanadate with SO_2 produces on gentle heating an olive color (I) in arsenate (4 cc.), an azure (II) one in phosphate. Both compds. give with strychnine-H_2SO_4 the rose color characteristic for the higher V oxides. Another indication of a probable reduction of As_2O_5 is given by the fact that H_2S ppts. As_2S_3 and S from a mixt. of arsenate with a slight excess of the reagent in HCl. However, the $KMnO_4$ consumption of both compds. was equal to that of the reagent alone; after 24 hrs.' exposure to light it was even greater. An olive *V compd.* colorimetrically comparable with I appears as an intermediate product when vanadate is reduced with Zn-AcOH or when the SO_2-free blue oxide is exposed to light for 5 days. MARY JACOBSEN

Determination of starch by calcium chloride. G. CHABOT. *Bull. soc. chim. Belg.* **35**, 130–1(1926).—C. confirms Mannich's method (*C. A.* **14**, 3481) of soln. of the sample in 33% $CaCl_2$ soln. (by wt.) and detn. of the rotary power of the soln. in an ordinary saccharimeter. It is important that the $CaCl_2$ be pure and neutral (p_H of soln. 6.68 approx.), since with ordinary calcined $CaCl_2$ giving an alk. soln. (p_H 10.3) gelatinization of the sample prevents prepn. of the soln. W. B. PLUMMER

Studies of quantitative analysis using bromine. I. Determination of thiocyanic acid, arsenious acid and antimony. TAMAKI NAKASONO AND SENKICHI INOKO. *J. Chem. Soc.* (Japan) **47**, 20–7(1926).—The effect of acidity on the titration of HCNS (*A*), H_3AsO_3 (*B*), and Sb (*C*) with $KBrO_3$ was studied, the end points being detd. by decolorization of methyl orange or by the sudden change of the e. m. f. of the solns. The concns. of the HCl should be 0.3–0 6 *N* in *A*, 0.3–2 *N* in *B* and 1.3–2 *N* in *C*, when methyl orange is used, and 0.3–3 *N* in *A*, 0.3–6 *N* in *B*, and 1.3–6 *N* in *C* in the e. m. f. method. The methyl orange method is inferior to the e. m. f method by the narrowness of the range of concn. of the acid. In *B* and *C*, the differences of the e m. f. at the end point decrease as the concns. of the acid increase; this is the defect in the e. m. f. method. The procedure of the analysis is a follows: The sample is weighed into a beaker, and 20–40 cc. of 2 *N* HCl and 10 cc. of 5% KBr are added. The soln. is diluted to 100 cc., and titrated with 0.1 *N* $KBrO_3$ at ordinary temp. The end point is detd. by the sudden change of the e. m. f. of the soln. or by the decolorization of methyl orange. In the case of Sb, there is no need to heat the soln. (cf. Cumming and Kay, Quantitative Chem. Analysis, 2nd Ed., 117). Results are shown with tables and diagrams. K. KASHIMA

The determination of acidity. ERNEST LITTLE. *J. Am. Pharm. Assoc.* **15**, 178–89(1926).—An essay in which the history of electrometric titrations is related in considerable detail and the theory explained. L. E. WARREN

Determination of nitrosylsulfuric acid in sulfuric acid solutions. E. F. WILKINS AND H. W. WEBB. *J. Soc. Chem. Ind.* **45**, 304–5T(1926).—Difficulties were encountered in detg. accurately the nitrosylsulfuric acid content of concd. solns. by the usual $KMnO_4$ method. After some exptl. tests the method was modified as follows: Dil. 25 cc. of 0.1 $KMnO_4$ to 250 cc. in a 750-cc. Erlenmeyer flask and quickly introduce enough nitrosylsulfuric acid soln. to react with about 70% of the $KMnO_4$. Heat 30 min. at 50°, add a slight excess of standard Fe^{++} soln. and titrate this last excess with more $KMnO_4$. By this method very pure nitrosylsulfuric acid can be analyzed satisfactorily. W. T. H.

The oxidation of manganese to permanganic acid. Application to quantitative analysis. A. TRAVERS. *Ann. chim.* **6**, 56–86(1926); cf. *C. A.* **20**, 2443.—Mn is oxidized practically instantaneously from the bivalent to septavalent state by Ag_2O_2 even in the cold but the action of other oxidizers is slower and all of the Mn is not immediately oxidized to $HMnO_4$ by them. $HMnO_4$ in hot soln. reacts with Mn^{++} and also with Mn^{+++}. In quant. reactions involving the complete oxidation of Mn, a no. of oxidizers can be used successfully if the quantity of Mn to be oxidized is small (less than 10 mg.) but otherwise there is likelihood of some of the $HMnO_4$ being reduced. Thus with less than 10 mg. of Mn, the oxidation is possible by persulfate alone in the presence of HF, H_3PO_4 or HPO_3. In that case the initial oxidation is an incomplete formation of $HMnO_4$, which is partially reduced to Mn^{+++} by reaction with the residual Mn^{++} and the Mn^{+++} is eventually oxidized to $HMnO_4$ again. If considerable Mn is present, however, some of the Mn is pptd. as MnO_2 and the oxidation to $HMnO_4$ is incomplete as a rule. If HPO_3 is present, however, the MnO_2 tends to remain in soln. in which case it can be oxidized. In the presence of H_2SO_4, or HNO_3, a sol. persulfate and a little Ag^+ cause the formation of Ag_2O_2, which is capable of oxidizing small quantities of Mn quant. to $HMnO_4$ but with larger quantities the addition of HPO_3 is necessary. W. T. H.

Determination of calcium carbide in calcium cyanamide. G. FLUSIN AND H. GIRAN. *Chimie et industrie* **16**, 179–80(1926).—Some applications of the method

abstracted in *C. A.* **20,** 3145, are given with illustration of the app. used. In the previous abstract the absorbent is incorrectly given as ammoniacal AgOAc instead of ammoniacal $AgNO_3$. A. PAPINEAU-COUTURE

Necessity of testing for the absence of nitric acid in the Marsh test for arsenic. F. SCHOOFS. *Bull. soc. chim. Belg.* **35,** 121–9(1926).—The presence of small amts. of N oxides in the atm. in the Marsh app. tends to vitiate the test by oxidation of the AsH_3 to As_2H_2, while larger amts. may cause explosions. It is recommended that the test soln. be examd. for HNO_3 (by brucine, Ph_2NH, etc.) before introduction into the app. H_2SO_4 solns. contg. HNO_3 should be evapd., diluted to hydrolyze the nitrosylsulfuric acid formed, concd. again, and tested for residual HNO_3. Exptl. data are given for the amt. of NO formed from mixts. of H_2SO_4 and HNO_3 under various conditions similar to those of the Marsh test. W. B. PLUMMER

Some new analytical reactions of the platinum metals. S. C. OGBURN, JR. *J. Am. Chem. Soc.* **48,** 2493–507(1926).—The behavior of Ru, Pd, Os, Ir and Pt toward some 120 different reagents was studied and the results are tabulated. Several new color reactions were found to be useful in detecting several of the metals when present in a fairly pure state. The theory relative to the formation of coördinated salts is discussed. W. T. H.

A qualitative separation of the platinum metals. S. C. OGBURN, JR. *J. Am. Chem. Soc.* **48,** 2507–12(1926).—A qual. scheme, far simpler than any hitherto proposed, is described which is capable of giving quant. results within 3% of the actual content. Thus the greatest error in a test analysis amounted to 11 mg. of Ir when 405 mg. was present. In brief, the sepn. calls for the pptn. first of $Pd(C_4H_7O_2N_2)_2$ by treatment with dimethylglyoxime, then of Pt as $Pt(C_{10}H_7O_4N_2)_2$ by the addition of α-furildioxime, of Rh as $K_3Rh(NO_2)_6$, of Ir by pptn. as metal insol. in NaOCl soln., and finally of Os by pptn. as metal sol. in NaOCl. Complete details are given and many precautionary notes. W. T. H.

The determination of selenium and tellurium by means of potassium permanganate. W. T. SCHRENK AND B. L. BROWNING. *J. Am. Chem. Soc.* **48,** 2550–3(1926).—Dissolve about 0.15 g. of SeO_2 or TeO_2 in 25 cc. of 40% H_2SO_4, heating if necessary. Dil. to 150 cc., add 12 g. of Na_2HPO_4 and about 10 cc. of $KMnO_4$ in excess of that necessary for the complete oxidation. After 10–30 min. titrate the excess permanganate electrometrically with standard $FeSO_4$ soln. If Te and Se are both present, the Te alone can be detd. separately by oxidation with $K_2Cr_2O_7$ (Schrenk and Browning, *C. A.* **20,** 560). W. T. H.

Test for cadmium in the presence of copper. G. M. KARNS. *J. Am. Chem. Soc.* **48,** 2626–7(1926).—In the regular qual. scheme, remove the excess of NH_3 from the filtrate obtained from the $Bi(OH)_3$ pptn., add 3–4 cc. of 10% NH_4Cl if this quantity of NH_4 salt is not already present and enough satd. $NaHCO_3$ soln. to double the vol. If 1 mg. of Cd is present in 10 cc. of soln., a white ppt. of $CdCO_3$ will be obtained. W. T. H.

Determination of tin in cassiterite. A. PIRLOT. *Bull. fed. ind. chim. Belg.* **5,** 281–4(1926).—Evap. 3 g. with 30 cc. concd. HCl to dryness, add dil. HCl, filter, dry the residue and det. its loss of wt. on heating 2 hrs. in H_2 at 740°; dissolve the reduced Sn in concd. HCl, evap., add dil. HCl and filter, repeating the reduction on the residue (the av. loss in wt. on the 2nd reduction is 0.0028 g. corresponding to 0.3% Sn on a 3 g. sample). Sn is calcd. as equiv. to the loss in wt. (O content) shown by the 2 reductions; other reducible metals are removed in the HCl solns. Results as tabulated agree very closely with ordinary gravimetric (wet) methods, the method being rapid and suitable for com. analyses. W. B. PLUMMER

Determination of carbon in cast iron. J. T. MACKENZIE. *Iron Age* **118,** 415–6 (1926).—The train for the direct, dry combustion of the sample is somewhat simplified. The O_2 is passed through a tower contg. 4-mesh soda lime (15% H_2O) at the bottom, a layer of asbestos and on top of this some dry 12-mesh soda lime. Ascarite will do but is more expensive. In the combustion tube, the gas passes first through an alundum thimble (which serves to keep the end of the tube cool near the stopper), then over the sample on a bed of Fe_2O_3 (preferred to alundum), then through oxidized Cu gauze and finally through another alundum thimble contg. asbestos. On leaving the tube at the front end of the furnace, the gas is passed through a relatively large bulb consisting of two chambers, the first of which is loosely packed with glass wool and the second with glass beads. A stopcock at the top permits the introduction of concd. H_2SO_4 satd. with CrO_3, to wet the beads, and a stopcock at the bottom permits the withdrawal of the acid after it has become green by reduction of the Cr. This tube serves to re-

move all the SO_2 from the combustion gases. The CO_2 is removed by absorption with ascarite in the usual way. W. T. H.

The detection of small quantities of silver and cadmium. W. GEILMANN. *Z. anorg. allgem. Chem.* **155,** 192-8(1926).—By the methods of blowpipe analysis and microchem. tests, it is easily possible to detect 0.005% of Ag or 0.002% of Cd in a sample of material weighing about 0.1 g. The application of these tests to ores and to glass is described with considerable detail. By heating Ag ore with a reducing flux and litharge, the Ag is obtained in a Pb button weighing about 0.5 g. This button is cupelled until the greater part of the Pb is removed. The residue, about the size of a mustard seed, is dissolved in a few drops of HNO_3 and the soln. evapd. with a drop of 2 *N* H_2SO_4. The moist sulfates are treated with a few drops of water and the Ag_2SO_4 soln. decanted off from the residual $PbSO_4$. By mixing with 10% HCl and a drop of 2% $AuCl_3$, a ppt. of AgCl is obtained if much Ag is present and by adding RbCl the characteristic, blood-red Rb-Ag-Au chloride is obtained. Or, the final sulfate soln. can be tested with $K_2Cr_2O_7$ to see if $Ag_2Cr_2O_7$ is formed. In the Cd test, heating 0.1 g. of the sample with 0.1 g. of native $FeCO_3$ results in the distn. of metallic Cd, which collects as a dull deposit on the cool walls of the glass tube used. By passing S vapors over the sublimate, characteristic CdS is obtained. W. T. H.

Tungsten products. C. COULSON-SMITH. *Chem. Trade J.* **79,** 248-50(1926).—Methods for the detn. of W in wolframite, of W, C and S in W powder and of W in crude tungstate melt are described. The methods selected are good ones and correspond to the best current practice. W. T. H.

The determination of silver, gold and platinum in anode slimes. ERNST ECKERT. *Metall u. Erz* **22,** 595-8(1925).—Ten g. of slime is dissolved in HNO_3, filtered, the Ag pptd. with HCl and weighed. Au and Pt are detd. by scorification and cupellation. The Ag bead is dissolved in HNO_3, a residue of Au and Pt. being left. The Ag is pptd. as chloride and the filtrate evapd. to dryness. The residue is dissolved in HCl and the soln. transferred to a Pb capsule, evapd to dryness, and cupelled with most of the Pt and Au and sufficient Ag for parting. The bead is parted in H_2SO_4 and the residue ignited and weighed. After re-alloying with Ag, the bead is parted with HNO_3 repeatedly until the Au residue is of const. wt. Pt is found by difference. C. G. KING

Detection and determination of mercury in acetic acid made from acetylene. G. REIF. *Arb. Reichsgesundh.* **57,** 173-8(1926).—Hg is isolated by electrolysis in H_2SO_4 soln. with Pt anode and Au cathode, 0.1 amp. and 3-4 v. It is identified microscopically or as HgO. Sensitiveness of the latter test: 0 01 mg./100 cc. 50% AcOH. For the detn. the cathode may be weighed, if other metals are absent. Otherwise the Hg is distd. off in a quartz tube, dissolved in HNO_3, reduced with CH_2O in $NaNO_3$-KI soln. and titrated with 0.02-0.01 *N* I in AcOH soln. Recent samples coming from an apparently improved mfg. process were free from Hg. An older sample of a com. pure acid contained 0.6 mg /100 cc MARY JACOBSEN

Determination of zinc by means of zinc acetate. HENRIËTTE J. RAVENSWAAY. *Chem. Weekblad* **23,** 375(1926).—Ignition of $Zn(OAc)_2$ gives irregular results in the wt. of ZnO. $Zn(OAc)_2$ appeared to be considerably volatile even below 100°. For qual. work conversion of the acetate into some other salt, *e. g.*, nitrate by HNO_3 is necessary. B. J. C. VAN DER HOEVEN

Analysis of dental gold alloys. WM. H. SWANGER. *Bur. Standards Sci. Papers* **21,** No. 532, 209-39(1926).—This excellent paper gives sp. directions for the detection and detn. of Ag, Au, Pt, Pd, Ir, Rh, Cu, Zn, Ni, Sn, Mn, Fe and Mg. The methods found in the literature for the general detection and detn. of these elements were modified and adapted especially for the analysis of dental alloys. In this work some 40 different alloys were analyzed and the typical compns. are shown. For the detn. of all the constituents except Fe, Mn and Mg, dissolve 2 g. of the sample in dil. *aqua regia* and after the removal of excess acid, filter and examine the residue for AgCl (sol. in NH_4OH and repptd. by HNO_3) and for Ir. If, after igniting in H_2, more than 20 mg. of Ir is obtained, it will be found contaminated with Pt and the method of Gilchrist (*C. A.* **18,** 363) should be used for detg. Ir. After the removal of the AgCl from the original soln., ppt. hydrated SnO_2 by adding NaOAc and boiling. No other constituent of the alloy will ppt. except Fe, which is rarely present. Next ppt. Au by satg. with SO_2, filter and ppt. Cu as $Cu_2(SCN)_2$. Remove HNO_3 by evapn. and fuming with H_2SO_4. Digest with dil. HCl, ppt. Pt as sulfide by H_2S and weigh as metal. If Rh is present it will be weighed with the Pt but can be sepd. by the method of Wichers (*C. A.* **18,** 2852). After this, ppt. Zn as ZnS by H_2S is 0.0, N H_2SO_4, Ni as the salt of dimethylglyoxime, and in the final filtrate det. Mn by the bismuthate method. In a sep. sample det. Fe and Mg by the usual methods. W. T. H.

A new gravimetric method for determining bases of the diphenyl series as well as a description of some new complex salts of these bases. WALTHER HERZOG. *Chem.-Ztg.* **50,** 642–3(1926).—Benzidine and tolidine form complexes with mercuric halides. Thus, using Bzd to designate benzidine and Tld for tolidine, the following salts are described: $[HgBzd]Cl_2$, $[HgBzd]Br_2$, $[HgBzd]I_2$, $[HgTld]Cl_2$, $[HgTld]Br_2$ and $[HgTld]I_2$. These salts are sufficiently characteristic and insol. to be used in quant. analysis. To det. benzidine, for example, add a known vol. of $HgCl_2$ to the soln., filter and det the excess $HgCl_2$ in the filtrate by the method of Rupp, *C. A.* **1,** 393, 2992; **3,** 295. W. T. H.

Action of aliphatic and cyclic bases on salts of the metals. E. J. FISCHER. *Wiss. Veroff. Siemens-Konz.* **4,** 171–87(1925); *Brit. Chem. Abstracts* **1926A,** 492.—Qual. observations are given of the ppts from solns. of the heavy metals by 36 bases, including primary, secondary, tertiary, quaternary ammonium, and sulfonium bases, pyridines, piperazine, nicotine, glyoxaline, benziminazole dimethylpyrazole, antipyrine and urazole. Glyoxaline is recommended as a delicate test for Co, giving a violet-blue ppt. Applications to the sepn. of the various metals are discussed. A. W. FRANCIS

Detection of isopropyl alcohol. J. RAE. *Pharm. J.* **116,** 630–1(1926).—Into a 200-cc. flask place 20 cc of a 1% aq. soln. of $K_2Cr_2O_7$, 1 cc. H_2SO_4 and 10 cc. of the sample, distil slowly and collect 3 cc. Overlay with this a mixt of a 5% soln. of Na nitroprusside, an equal vol. of strong NH_4OH and about 0.32 g NH_4Cl. A purple ring noted after a few min. indicates acetone formed. The test was still obtained with this method in a diln. of 1%. S. WALDBOTT

A typical reaction of phenols. KURT BRAUER. *Chem.-Ztg.* **50,** 553–4(1926).—A general reaction is described, which may be used to distinguish between the dihydroxy- and the trihydroxy-phenols The phenol is first treated with phosphomolybdic acid and then with ammonia. The color is observed before and after the addn. of the ammonia. The 1,2-dihydroxy and the 1,2,3-trihydroxy derivs. of benzene are green after the phosphomolybdic acid treatment but turn blue with the addn. of ammonia. The 1,4-dihydroxy and the 1,2,4-trihydroxy derivs. are blue with phosphomolybdic acid and remain so with ammonia 1,3-Dihydroxy- and 1,3,5-trihydroxy-benzene are colorless with phosphomolybdic acid but turn blue with ammonia. R. C. NEWTON

Color tests of certain phenols with sodium nitroprusside. L. EKKERT. *Pharm. Zentralhalle* **67,** 566–8(1926) — Color tests are outlined for the following: *Carbolic acid,* 0.03 to 0.05 g in 0.5 cc of H_2O yields with 0.02 g. of Na nitroprusside in 4 cc. concd. H_2SO_4 an onion-red upper layer with a green contact zone, the mixed liquid being violet and finally green. With 1 cc. of H_2O the final color of the mixed liquid is blue. With 2 cc of H_2O the upper layer is bluish red, then violet, becoming green lower down; mixed, the color becomes bluish violet. *Thymol,* about 0.02 g. in 0.5 cc. alc., yields with above reagent a red upper layer with a green ring, becoming on mixing a deep green, on diln with H_2O red, with NH_3 green. With 2 cc. alc. the upper layer becomes brown-red with a green ring, the mixed liquid violet-brown, dild. with H_2O red, with NH_3 green. *Cresol crude,* 0.05 g in 0.5 cc. H_2O gives a dark mulberry-red upper layer, mixed liquid almost black, dild. with H_2O red, with NH_3 green. *Creosote Fagi,* 0.05 g. in 2 cc. alc. give red-brown upper layer, mixed liquid dark mulberry-red, with H_2O brown, with NH_3 grayish green. *Pyrocatechol,* 0.03 g. in 0.5 to 2 cc. H_2O gives a green upper layer with green ring, green mixed liquid, with H_2O grayish green, NH_3 brown-red. *Resorcinol,* 0.01 to 0.02 g. in 0.5 to 1 cc H_2O gives with the reagent a deep blue mixt., with H_2O brown-red, NH_3 rose-red. *Hydroquinol,* 0.02 to 0.03 g. in 0.5 to 2 cc. H_2O yields an upper brown layer merging downward into green; the mixt. brown, with H_2O brown, NH_3 brown. *Orcinol,* 0.03 g. in 0.5 cc. H_2O gives a brown-red upper layer becoming blue-red after about 10 min., mixt. dild. with H_2O reddish, NH_3 raspberry-red. *Pyrogallol,* 0.02 g. in 0.5 to 2 cc. H_2O gives a dark brown upper layer with trend to violet, mixt. with H_2O greenish brown to violet-black, with NH_3 the same. *Phloroglucinol,* 0.02 g. in 0.5 to 2.0 cc. H_2O gives a wine-red upper layer, the mixt. wine-red, with H_2O reddish, NH_3 greenish brown. *α-Naphthol,* 0.02 to 2.0 g. in 2 cc. alc. gives a greenish brown upper layer, the dark ring becoming deep green downward, the mixt. green, dild. with H_2O brown and turbid, NH_3 yellowish green. *β-Naphthol,* 0.02 g. in 0.5 to 2 cc. alc. gives a dark brown upper layer, mixt. the same color, dild. with H_2O or NH_3 brown. W. O. E.

Determination of the phenol content of crude cresol. WALTER QVIST. *Z. anal. Chem.* **68,** 257–73(1926).—When phenol is nitrated in accordance with the directions of Raschig (*Z. anal. Chem.* **40,** 496(1901)) for the detn. of *m*-cresol, a const. yield of 20.6 g. of picric acid is obtained from 10 g. of phenol. A part of the picric acid seps. out as solid and the remainder is to be found in the mother-liquor. This fact can be

utilized for detg. the phenol content of crude cresol. If the crude cresol contains only *o*- or *p*-cresol, then the solid obtained is pure picric acid; otherwise the pptn. must be carried out as described by Q. for the analysis of a mixt. of picric acid and trinitro-*m*-cresol (*C. A.* **19,** 1836). To det. the picric acid in the mother-liquor and wash-waters, distil with steam to remove interfering substances, cool the residual liquid and ext. with toluene. Shake the toluene ext. with an excess of NaOH soln. and titrate the excess of base. Working in this way it is easy to det. both the phenol and *m*-cresol contents of crude cresol. W. T. H.

A new fluorescent reaction of malic acid. S. A. Celsi. *Quim. e ind.* **3,** 205–6 (1926); cf. *Ber.* **1883,** 2119; **1884,** 1646.—Two cc. of the malic acid or malate soln. is heated 5 min. on the water bath with 2 cc. concd. HNO_3-free H_2SO_4 and a small quantity of orcinol, cooled, and dild. with 10 cc. water. Excess NH_3 makes the blue fluorescence of *homumbelliferone* appear. Sensitiveness 0.01 mg. The reaction is not specific with resorcinol, which forms umbelliferone also with citric and tartaric acids. Succinic acid does not interfere provided the temp. of condensation does not exceed 100°. $ZnCl_2$ instead of H_2SO_4 produces an undesirable yellowish green fluorescence because of the high temp. required for condensation. The fluorescence is preferably observed in daylight or Mg light. A blank is necessary. Mary Jacobsen

Analysis of commercial lactic acid. U. J. Thuau and Marcel Vidal. *J. Intern. Soc. Leather Trades Chem.* **10,** 257–8(1926).—Familiar methods for detg. acid and neutral SO_4 and Cl are described. H. B. Merrill

The acidimetric titration and composition of commercial lactic acid. R. Eder and F. Kutter. *Helvetica Chim. Acta* **9,** 557–78(1926).—The careful studies here recorded indicate that com. lactic acid is a mixt. of free α-hydroxypropionic acid, lactyl-lactic acid and water. In the attempt to det. lactide, which some authorities have believed to be present, values amounting to about 0.15% lactide were obtained but this probably means merely a slight error in the analytical data, and is within the permissible error, so that the conclusion is drawn that lactide is not present in the better grades of com. lactic acid. For the detn. of free lactic acid and its anhydride, weigh out p g. and dil. to about 20 cc. Titrate at once with a cc. of 0.1 N NaOH, using neutral red as indicator. Then add an excess, b cc., of NaOH and heat 10 min. on the water bath to accomplish the sapon. of the anhydride. After 10 min. heating, add c cc. of 0.1 N HCl which should represent about 1 cc. in excess of the amt. necessary for neutralization of the excess NaOH. Finish with d cc. of 0.1 N NaOH. Then 0.9 $(a + c - b - d)/p$ is the % of free lactic acid and 1.8 $(b + d - c)/p$ is the % of anhydride. A sample of "100% acid" was found to contain 39.6% of free lactic acid, 56.8% of anhydride and 3.5% of water. W. T. H.

The influence of sucrose on the determination of lactose by oxidation with iodine. Fr. Auerbach and G. Borries. *Arb. Reichsgesundh.* **57,** 318–24(1926); cf. *C. A.* **18,** 800.—In suitable buffer mixts. (0.01 mol. Na_2CO_3, 0.01 mol. $NaHCO_3$ in 140 cc.) glucose and lactose are quantitatively oxidized, the latter using up 1 mol. I, while fructose and sucrose are hardly attacked. An excess of at least 8 cc. 0.1 N I is indispensable for the complete oxidation of lactose. Under these conditions and in the presence of 1000 g. sucrose and 200 mg. lactose the quantity of oxidized sucrose is equiv. to 4 mg. lactose. It increases with the sucrose and lactose content and with the I excess. A correction may be made if the sucrose content is known. M. J.

A method for the determination of small amounts of quinine and quinidine with bromine water. S. Weiss and R. A. Hatcher. *Proc. Soc. Exptl. Biol. Med.* **23,** 33–5(1925).—When quinine is added to Br, they combine in definite proportions with the loss of the Br color in reflected light. Details of the method are given. The error is about 5%. C. V. B.

Short method for the estimation of selenium in organic compounds. W. E. Brady and R. E. Lyons. *J. Am. Chem. Soc.* **48,** 2642–8(1926).—The method consists in the volumetric pptn., from neutral soln., of Ag_2SeO_3 according to a modification of the Mohr method for halogen detn. Since the Carius treatment of Se-organic (halogen-free) compds. converts the Se to H_2SeO_3, the method is applicable to the analysis of such compds. that have been completely decompd. by the Carius treatment. C. J. W.

The CO_2 content of distilled water and its determination (Kolthoff) 2. Glycerol analysis (Prager) 27.

8—MINERALOGICAL AND GEOLOGICAL CHEMISTRY

EDGAR T. WHERRY

Volume isomorphism. J. F. SCHAIRER. *Proc. Yale Mineralog. Soc.* **1,** 13–6 (1923–4).—A review of the theories of Wherry, Zambonini and Wyckoff (all in *C. A.* **17,** 2253). J. F. S.

Mineral statistics. ANON. *Mineral Ind.* **34,** 813–85(1925).—Tables of production, imports and exports for the U. S. and other countries. A. B.

Mineralogical notes. FELIX MACHATSCHKI. *Z. Krist.* **63,** 457–65(1926).—M. describes some minerals from Pisek, including beryl and its decompn. products, feldspar, muscovite and andalusite. Two analyses of *beryl* and one of *muscovite* are given. L. S. RAMSDELL

Mineralogical notes from Moravia. V. ROSICKY. *Časopis Moravského Musea Zemského* **22,** 138–58(1926)(French résumé); *Mineralog. Abstracts* **3,** 123.—An *analysis of an opal* pseudomorph after calcite is given. J. F. SCHAIRER

List of minerals found in British Malaya with a description of their properties, composition, occurrences and uses. E. S. WILLBOURN. *J. Malayan Branch Roy. Asiatic Soc.* **3,** 57–100(1925); *Mineralog. Abstracts* **3,** 126.—An *analysis of chrome-ocher* and a partial analysis of *monetite* is given. J. F. SCHAIRER

Notices of Jugoslavian minerals. L. BARIC AND F. TUCAN. *Ann. Geol. penins. Balkan* **8,** 129–34, (Croat.), 134–5 (German) (1925); *Mineralog. Abstracts* **3,** 124.—Analyses of *rhodochrosite, epidote, galena, pyrite* and *hematite* are given. J. F. S.

The structure of tiemannite (HgSe) and coloradoite (HgTe). W. F. DE JONG. *Z. Krist.* **63,** 466–72(1926).—Tiemannite and coloradoite have either the zinc blende structure or something very closely approaching it. The lengths of the unit cubes are 6.04 and 6.43 A. U., resp., and the calcd. ds. are 8.41 and 8.20. The at. radii, based on a value for S of 1.02 in metacinnabarite (HgS), are Hg 1.50, Se 1.17 and Te 1.33 A. U. L. S. RAMSDELL

Hauerite in a salt-dome cap rock. A. G. WOLF. *Bull. Am. Assoc. Petr. Geol.* **10,** 531–2(1926).—Hauerite (MnS_2) has been found in the cap rock of the big hill salt dome, Matagorda County, Texas. A core at 1009 feet to 1012 feet contained several crystals and fragments. The two most nearly perfect crystals are octahedrons truncated by cubes; their crystallographic axial lengths are one inch. A globular cluster of crystals, two and one-half inches in diam., was picked up by the core barrel at a slightly greater depth. It contained 46.1% Mn and 52.5% S, d. 3.49. The associated rocks are limestone, calcareous clay with a little pyritiferous sandstone, and anhydrite. C. L. C.

Study of brown feldspar from Portland, Conn. J. F. SCHAIRER. *Proc. Yale Mineralog. Soc.* **2,** 20–1(1924–5).—An analysis and microscopic examn. showed the peculiar brown mottled feldspar to be a perthitic microcline with disseminated flakes of Fe_2O_3. J. F. S.

Mineralogical composition of the syenite at Plauen. D. S. BYELYANKIN AND S. I. TOMKYEÉV. *Ann. inst Polytechn. Pierre le Grand* **23,** 9 pp.(1915); *Mineralog. Abstracts* **3,** 80.—*Feldspar* from syenite at Plauen is a microcline perthite; an analysis of it is given. J. F. SCHAIRER

Diopside from Csiklovabanya. A. LIFFA. *Math. Természettud Értesitö* **42,** 224–38 (Hung.), 239 (German), (1926); *Mineralog. Abstracts* **3,** 99.—An analysis of diopside is given, with complete crystallographic and optical data. J. F. SCHAIRER

Cummingtonite from Sande, Ryfylke. C. W. CARSTENS. *Norsk. Geol. Tidsskrift* **5,** 351–7(1920); *Mineralog. Abstracts* **3,** 152.—An analysis of cummingtonite is given, and the compn. of cummingtonite, grünerite and anthophyllite are compared. J. F. SCHAIRER

Occurrence of gadolinite at Löuböle, Finland. E. H. KRANCK. *Acta Acad. Aboensis Math. Phys.* **3,** 16 pp.(1924); *Mineralog. Abstracts* **3,** 152.—An analysis of gadolinite gave: SiO_2 23.53, ThO_2 0.60, Y_2O_3 etc., 46.71, Ce_2O_3 etc., 2.82, Fe_2O_3 0.69, Al_2O_3 1.20, BeO 8.81, FeO 13.50, MnO trace, CaO 0.90, MgO 0.02, Na_2O 0.15, H_2O 0.31, S 0.88, sum 100.12%; sp. gr. 4.208. J. F. SCHAIRER

Prehnite rock from Mt. Botogal in Siberia. B. M. KUPLETSKY. *Compt. rend. acad. sci. Russia* **1925,** 84–7; *Mineralog. Abstracts* **3,** 86.—An analysis of prehnite is given. J. F. SCHAIRER

Ussingite and schizolite from Russia. E. M. BONSHTEDT. *Compt. rend. acad. sci. Russia* **1925,** 17–9; *Mineralog. Abstracts* **3,** 103.—An analysis of ussingite is given. J. F. SCHAIRER

The structure of olivine (Mg, Fe)$_2$SiO$_4$. W. L. BRAGG AND G. B. BROWN. *Z. Krist.* **63,** 538–56(1926).—The space group of olivine is V_h^{16}. The unit cell contains 4 mols. and has the dimensions a = 4.755, b = 10.21, and c = 5.985. There are definite (SiO$_4$) groups, consisting of a Si atom surrounded by 4 O atoms arranged tetrahedrally. This structure is similar to that of chrysoberyl (cf. *C. A.* **20,** 1154). L. S. R.

The nature of stibiobismuthinite. EMANUELE QUERCIGH. *Atti accad. Lincei* [6] **4,** 68–72(1926).—Stibiobismuthinite was described by König (*J. Acad. Nat. Sci. Phila.* [2] **15,** 424(1912)) as a new species of mineral of the compn. (Bi,Sb)$_4$S$_7$. The analyses, however, do not warrant the assumption of a new compd. of this type, for they show a deficiency of S for this formula, whereas actually excess S is present. The *compn. of the mineral* can be better explained as (Bi,Sb)$_2$S$_3$ + free S, the mineral being a solid soln. of Bi$_2$S$_3$ and Sb$_2$S$_3$ contg. inclusions of S. This structure was also rendered probable by the prepn. of synthetic, homogeneous, cryst. *sulfides contg. Bi and Sb,* of the general formula M$_2$S$_3$ and contg. excess free S. The method of prepn. was a modification of that of Geitner (*Ann. Chem. Pharm.* **129,** 350, 359(1864)), substituting the Sb-S mixt. by the pptd trisulfides contg. varying amts of excess S, and heating with aq. H$_2$S under pressure at 80–125°. The crystals were acicular and had the color and characteristic luster of the individual trisulfides. Furthermore *crystals of Sb$_2$S$_3$ and of Bi$_2$S$_3$ contg. inclusions of free S* and *mixts. of Sb$_2$S$_3$ and Sb$_2$S$_5$* were prepd. which had the same cryst. properties as natural antimonite or bismuthinite. Then again a crit. survey of analyses of antimonite and of bismuthinite by various workers shows the probable existence of free S in some cases. These arguments were fortified by exact measurements of the cryst. structures If stibiobismuthinite is then an isomorphous mixt. of Sb$_2$S$_3$ and Bi$_2$S$_3$ with occasional inclusions of free S it is the 1st case observed in nature of 2 trisulfides in solid soln. in large amts. C. C. DAVIS

Kaolin from Matraderecske. R. HOJNOS. *Foldtani Kozlony* **54,** 79–85 (Hung.), 189–95 (German), (1924); *Mineralog. Abstracts* **3,** 69.—Kaolin is the product of post-volcanic action on biotite-hornblende-andesite, pyroxene-andesite and their tuffs. An analysis is given. J. F SCHAIRER

Preliminary note on a radioactive mineral. D. GUIMARAES. *Bol. Inst. Brasileiro de sci.* **2,** 56–7(1926); *Mineralog. Abstracts* **3,** 113 —A dark chocolate to clear maroon colored mineral which gives off He was found at Divino, Minas Geraes, Brazil. It resembles ampangabeite, but contains much more TiO$_2$. J. F. SCHAIRER

Eschwegite, new mineral from Minas Geraes. D. GUIMARAES. *Bol. Inst. Brasileiro de Sci.* **2,** 1–2(1926); *Mineralog. Abstracts* **3,** 113 —A dark reddish gray mineral from the upper Rio Doce gave: Ta$_2$O$_5$ 21.58, Cb$_2$O$_5$ 25.17, TiO$_2$ 18.75, (Y,Er)$_2$O$_3$ 27.28, ThO$_2$ 0.57, UO$_2$ 1.96, Fe$_2$O$_3$ 2.05, H$_2$O 3.09, sum 100.45%; formula 2Ta$_2$O$_5$.4Cb$_2$O$_5$.-10TiO$_2$.5Y$_2$O$_3$.7H$_2$O. J. F. SCHAIRER

Arrojadite, a new mineral of the wagnerite group. D. GUIMARAES. *Publicacao Inspectoria Obras Contra as Seccas, Rio de Janeiro* No **58,** 11 pp.(1925); *Mineralog. Abstracts* **3,** 113.—A green pegmatite mineral gave: P$_2$O$_5$ 34.32, Fe$_2$O$_3$ 12.39, FeO 19.84, MnO 12.33, CaO 5.69, MgO 1.85, Na$_2$O 4.67, K$_2$O 1.45, Li$_2$O trace, H$_2$O− 0.44, H$_2$O+ 4.96, SiO$_2$ 0.66, SnO$_2$ 1.52, sum 100.12%. Deducting impurities and calcg. the Fe as ferrous gives the formula $4R_3^IPO_4.9R_3^{II}P_2O_8$, which is near triphylite. J. F. S.

Mineralogical and petrographic notes. R. L. CODAZZI. *Biblioteca Museo Nacional Bogota* **1925,** 91 pp.; *Mineralog. Abstracts* **3,** 129.—"*Viterbite*" is a compact chocolate-colored or white amorphous mineral from Santa Rosa de Viterbo, Boyaca Analysis gave: SiO$_2$ 21.00, P$_2$O$_5$ 6.00, Al$_2$O$_3$ 40.00, Fe$_2$O$_3$ 2.30, H$_2$O 30.70, sum 100.00%. It is regarded as contg. 8 allophane + 1 wavellite and is compared with "trainite" J. F. SCHAIRER

Pitchblende in northern Karelia. P. K. GRIGOREV. *Botschaften Geol. Komitöts* No. **1,** 33–4(1925); *Mineralog. Abstracts* **3,** 146 —A preliminary analysis of pitchblende gave: U$_3$O$_8$ 80.63, PbO 12.9, rare earths 3.2, SiO$_2$ 0.37, CaO 1.2, sum 98.3%. J. F. SCHAIRER

Experiments on the dehydration of gypsum. J. T. MCCORMACK. *J. Geology* **34,** 429–33(1926).—Expts. showed that at ordinary temp. and within short periods (1/2 hr. to 5 days) and pressures ranging from 600 to 316,000 lbs per sq. in. no dehydration of gypsum was produced. Other samples were subjected to 600 to 1000 lbs. pressure at 50°, 100°, 150° for 1/2 hr. and still others heated to 150° under normal atm. pressure. The conclusion reached was that temp. is far more important than pressure in the dehydration of gypsum. W. F. HUNT

Occurrence of halotrichite, East Greta colliery. J. C. H. MINGAYE. *Bull. Geol.*

Survey N. S. Wales, No. **6**, p. 154(1925); *Mineralog. Abstracts* **3**, 53.—An analysis of halotrichite occurring as an oxidation product of pyrite rock is given. J. F. S.

Mineralogy and petrography of the deposits of wolframite and scheelite in Kharanor. L. A. Vardanyantz. *Ann. inst. Polyt. Don, Novotcherkassk* **9**, 133–61(1923–4); *Mineralog. Abstracts* **3**, 140.—Analyses of wolframite and scheelite are given. J. F. S.

Wolframite crystals from Vogtland. A. Jahn. *Mitt. Vogtl. Ges. Naturfor. Plauen* No. **3**, 1–9(1926); *Mineralog. Abstracts* **3**, 154.—An analysis of wolframite from Tirpersdorf gave the formula $5FeWO_4.MnWO_4$. J. F. Schairer

Iron meteorite from Tepla, Bohemia. B. Ježek. *Rozpravy Česke Akad.* **33**, 6 pp.(1923); *Bull. internat. Acad. Sci. Boheme* **25**, 275–6; *Mineralog. Abstracts* **3**, 91.—An analysis of the meteorite showed the presence of troilite, Reichenbach-lamellas, schreibersite-rhabdite and cohenite. J. F. Schairer

Quantitative composition of three meteorites. P. N. Chirvinskii. *Mem. Soc. Roy. Sci. Boheme, cl. Sci.* **1926**, 23 pp. (French résumé); *Mineralog. Abstracts* **3**, 92.—Analyses of 3 meteorites from Russia are given. J. F. Schairer

Tektites. H. Michel. *Ann. Naturhist. Mus. Wien* **38**, 153–61(1924); *Mineralog. Abstracts* **3**, 97.—Tektites were formed by the oxidation in the earth's atm. of the diffuse matter of the tails of comets. Surface etching of the tektites is attributed to subsequent corrosion. J. F. Schairer

Underlying principles of limestone replacement deposits of the Mexican Province. B. Prescott. *Eng. Mining J.* **122**, 246–53, 289–96(1926).—The principles of ore deposition are developed for limestone replacement deposits in which igneous rocks (genetically connected) do not occur in the area. The ore bodies are continuous from the point of entrance into favorable limestones in depth, to the surface, to the point of egress from the favorable beds or until they become extremely attenuated. The progress of the mineralizer is nearly always upwards from its source. The analysis of each ore body is distinctive and quite invariable. Analytical data on Mexican ore for 1913 and 1925 does not show much change. The ore deposited in the portions farthest from the source has passed through and inside the walls of the ore body nearer the source. J. F. Schairer

Lead-zinc chimneys in limestone. J. E. Spurr. *Eng. Mining J.* **122**, 296–8 (1926).—S. comments favorably on the principles of limestone replacement deposits (cf. preceding abstract) outlined by Prescott and uses the data to confirm his theories of ore magmas. J. F. Schairer

Solubility of tin minerals. G. U. Greene. *Eng. Mining J.* **122**, 417–9(1926).—The soly. of Sn minerals from Llallagua, Bolivia, in 33% HCl was detd. An *analysis of cassiterite* is given, as well as data on the Sn content of mine waters. The data are used to confirm the existence of secondary Sn deposits. The mechanism of secondary enrichment is: oxidation of pyrite, forming H_2SO_4, formation of $Fe_2(SO_4)_3$, action of H_2SO_4 on phosphates giving phosphoric acid, combined action of the acids and ferric salts on cassiterite, probable difference in potential set up in impure cassiterite in acid soln. aiding dissolution of the primary SnO_2, neutralization of the acids at a lower level, hydrolysis of the Sn salts and pptn. of stannic acid. This, on dehydration, would give SnO_2, secondary cassiterite. J. F. Schairer

Periods of igneous activity in Japan with special reference to metallogeny. T. Kato. *J. Geol. Soc. Tokyo* **31**, 1–13, *Mineralog. Abstracts* **3**, 133.—Cambrian time was an important metallogenic epoch yielding extensive hematite-magnetite schists. Contact-metamorphic deposits of Fe and Cu were formed during late Mesozoic time. Most of the Cu, Pb-Zn and Au-Ag veins were formed during the Tertiary and are characterized by pyrophyllization and silicification of the wall rocks of the veins. J. F. S.

Iron ore in the massives of Ytre Fosen, Norway. C. E. Wegmann. *Z. prakt. Geol.* **2**, 17–23(1926).—The general geology is described, also the mineralogical changes due to contact metamorphism. Hematite is found to replace the magnetite in part. W. H. Newhouse

The magnetite ore deposits in the Czechoslovakian republic. F. Sellner. *Z. prakt. Geol.* **3**, 33–40(1926).—A geological description. The magnetite is always associated with pyroxene and occasionally with garnet. W. H. Newhouse

Manganese and iron-ore deposits near Gradsko in Macedonia. M. T. Lukovic. *Ann. geol. penins. Balkan* **8**, 136–9(1925); *Mineralog. Abstracts* **3**, 76.—Metasomatic deposits of oxides of Fe and Mn form large lenses in schists and marble. The compn. of the ore ranges from 63.89 to 4.00% Fe and 0.98 to 61.72% Mn from the north to the south of the area. J. F. Schairer

Magmatic nickel deposits of the Bushold Complex in the Rustenburg district,

Transvaal. P. A. WAGNER. *Mem. Geol. Survey S. Africa* No. **21,** 181 pp.(1924); *Mineralog. Abstracts* **3,** 44.—Droplets of gassy Fe-Ni-Cu matter sepd. at a certain stage in the crystn. from the parent norite magma and were segregated under the influence of gravity. J. F. SCHAIRER

The gold deposit of San Ramon, Mendoza, Argentina. E. KITTL. *Z. prakt. Geol.* **3,** 40–4(1926).—A general description of the geology and a discussion of the genesis and mineralizing soln. are given. Pyrite brought in the Au; galena, quartz and silicates are present; propylitization has taken place, and some kaolin is found. W. H. NEWHOUSE

The vein constituents and the occurrence and distribution of gold in the primary zone of the old gold quartz veins. F. BUSCHENDORF. *Z. prakt. Geol.* **1,** 1–11(1926).—A general discussion with bibliography. The age relations of the various minerals found in Au deposits are summarized, an elaborate list being given. There is much overlapping in the time of deposition. W. H. NEWHOUSE

Geology of the Yoquivo, Chihuahua, mining district. C. W. HALL. *Trans. Am. Inst. Mining Met. Eng.* No. **1530-I,** Feb. 1926 (preprint), 15 pp.—Ag and Au are the economic minerals produced. Secondary enrichment played a major role in the formation and rearrangement of ore bodies. J. F. SCHAIRER

Ore deposition and enrichment at the Magna Mine, Superior, Arizona. M. N. SHORT AND I. A. ETTLINGER. *Trans. Am. Inst. Mining Met. Eng.* No. **1552–I** Feb., 1926 (preprint) 54 pp.—Primary bornite, chalcopyrite, chalococite, tennantite, sphalerite and galena occur as rich ores. J. F. SCHAIRER

Mineralogy of the Carboniferous and underlying formations of Kladno. F. SLAVIK. *Časopis Národniho Musea, Prague* **99,** 112–20(1925); *Mineralog. Abstracts* **3,** 122.—The sulfide minerals are of sedimentary origin, their formation having been aided by biochem. processes. J. F. SCHAIRER

The structure of native platinum. S. F. ZHEMCHUZHNII. *Z. anorg. allgem. Chem.* **156,** 99-142(1926).—See *C. A.* **17,** 3469. E. H.

Platinum in southern Rhodesia. B. LIGHTFOOT. *S. Rhodesia Geol. Survey, Short Report* No. **19,** 13 pp. (1926); *Mineralog. Abstracts* **3,** 76.—Pt has been found in 3 areas on the Great Dyke. The distribution of Pt is related to that of the Fe and Cu sulfides in the rock. J. F. SCHAIRER

Preliminary report on the platinum deposits in the southeastern part of the Rustenburg district, Transvaal, P. A. WAGNER. *Mem. Geol. Survey S. Africa* No. **24,** 39 pp. (1926); *Mineralog. Abstracts* **3,** 137.—Pt has been found in Merensky reef on the west side of the Bushveld complex, being concd. in the sulfide portion of the rock. J. F. SCHAIRER

Asbestos from Dobschau and its manufacture. G. RAKUSZ. *Földtani Kozlony* **54,** 56–9 (Hung.), 174–6 (German) (1924); *Mineralog. Abstracts* **3,** 100.—Low grade asbestos occurs in seams in the serpentine of the Kälbel and Birkeln hills. An analysis is given. J. F. SCHAIRER

Asbestos-chrysotile. L. B. RILEY. *Proc. Yale Mineralog. Soc.* **1,** 8–10(1923–4).—A description of occurrence, classification, uses and production of asbestos. J. F. S.

Lithium minerals. E. J. ROBERTS. *Proc. Yale Mineralog. Soc.* **1,** 10–3(1923–4).—A description of the mineral sources of Li salts, with their occurrence and production. J. F. SCHAIRER

Fuller's earth in Georgia (Imeretia and Guria). A. A. TVALDCHRELIDZE. *Bull. Univ. Tiflis* **3,** 329–40(1923); *Mineralog. Abstracts* **3,** 68.—Fuller's earth was derived from volcanic ashes and tuffs contg. amphibole and pyroxene; 6 analyses are given. The dehydration curve shows breaks at 110°, 300° and at red-heat. The absorptive power is variable. Absorption tests were also made on clay, powdered laumontite, gypsum, feldspar and calcite. J. F. SCHAIRER

Report from the chemical laboratory of the Hungarian Geological Survey for 1919-1923. K. EMSZT. *A. Magyar Kir. Föld. Intézet évi Jelentése* 140–50(1925); *Mineralog. Abstracts* **3,** 77.—Analyses of mineral waters, Fe ores and 50 *bauxites* are given. J. F. SCHAIRER

Magnesite in California. W. W. BRADLEY. *Bull. Calif. State Mining Bureau* No. **79,** 147 pp., (1925); *Mineralog. Abstracts* **3,** 77.—A description of deposits, origin and industrial applications. J. E. SCHAIRER

Russian graphite. N. YAKHONTOV. *Natural Productive Forces of Russia* No. **55,** 137 pp.(1925); *Mineralog. Abstracts* **3,** 74.—Petrographic description of deposits with analyses. The graphite in nepheline-syenite is of pneumatolytic-contact origin, being formed from hydrocarbons. An *analysis of garnet* from the graphite deposits is also given. J. F. SCHAIRER

Organic theories of oil origin. Ernest Clark. *J. Inst. Petr. Techn.* **12,** 257–77; discussion 278–87(1926).—A unified review of existing organic theories of oil-origin as a foundation for future research. References. M. B. Hart

Original sources of oil in Colombia. F. M. Anderson. *Bull. Am. Assoc. Petr. Geol.* **10,** 382–404(1926).—The Cretaceous rocks of Colombia have been laid down upon an ancient floor of metamorphic and cryst. rocks. The lower and upper groups are largely detrital in origin, while the middle group is partly detrital and partly organically derived limestones and marls. Stutzer has asserted that "all of the oil in Colombia emanated from the lower Cretaceous." All of the producing wells in Colombia are in Tertiary formations and are drilled in situations such that it appears highly improbable that the oil could have emanated from Cretaceous strata. In parts of Colombia where the older Tertiary beds are purely marine, foraminiferal remains are abundant and could constitute the source material of the oil. In other parts of the country where these beds are non-marine they include lignitic and carbonaceous strata, such as might have contained the source material of the oil, as is the case at Trinidad and, perhaps, also in some of the oil fields of the Maracaibo basin in Venezuela. C. L. C.

Geology and oil developments of the Cold Bay district, Alaska. W. R. Smith. U. S. Geol. Survey *Bull.* **783-C,** 63–88(1926).—Several oil seepages and 2 patches of residue occur on Pearl Creek dome. The residue has been used successfully as a fuel for drilling. Analysis of a sample of oil from Barbara Creek indicates that the oil is a naphthene-base petroleum and not an "asphaltic-base." It contains but a small proportion of paraffins. The natural residue from a seepage on the Pearl Creek dome yielded 63.5% of bitumen, sp. gr. 1.021, the remainder being nearly all dried vegetable matter. The possibility of obtaining oil in com. quantities is considered favorable by geologists. L. W. Riggs

Summary of recent surveys in northern Alaska. P. S. Smith, J. B. Mertie, Jr. and W. T. Foran. U. S. Geol. Survey *Bull.* **783-E,** 151–66(1926).—This summary relates to oil prospects exclusively. L. W. Riggs

Were diatoms the chief source of California oil? G. M. Cunningham. *Bull. Am. Assoc. Petr. Geol.* **10,** 709–21(1926).—Recent work has shown that the org. shales in other petroliferous provinces do not necessarily contain recognizable fossil remains, and that org. material carried into the basins of deposition by rivers and pptd. by saline waters, is an adequate source for the petroleum. Decay-resistent vestiges of plant and possibly animal remains may have contributed to the supply. The shales within the oil zones of the fields of California have many characteristics which suggest that they may have been the source of the oil now contained in the sandy beds with which they are interbedded. The present position of the oil in the Pliocene section and the distribution of the oil in the anticlinal structures in the Los Angeles basin point to the Pliocene sediments, which are relatively free from diatoms, as the source rocks. The hypothesis seems to fit the observed conditions in southern California fields better than the diatom theory. C. L. C.

The relation of Foraminifera to the origin of California petroleum. T. F. Stipp. *Bull. Am. Assoc. Petr. Geol.* **10,** 697–702(1926).—It has been recently suggested that Foraminifera, whose tests are found in abundance in rocks closely associated with the oil, may have been an important source of the oil Recent studies of the life history of the Foraminifera show that a very large proportion of the tests present in the strata as fossils may have been empty of animal tissue at the time of burial. This and other related facts make it appear probable that Foraminifera have been of less importance than diatoms as sources of the petroleum of California. C. L. C.

Lithologic character of shale as an index of metamorphism. J. H. Wilson. *Bull. Am. Assoc. Petr. Geol.* **10,** 625–33(1926).—The paper attempts to correlate the lithologic character of the Cretaceous shales of the Rocky Mountain region with the degree of metamorphism to which they have been subjected, with a view of making use of the lithologic character of the shale as an index of metamorphism where coals are lacking. The effect of the metamorphic consolidation on the specific gravity, hardness, fissility, crushing strength, behavior in water, weathering, general appearance, oil and gas content of reservoirs, and kerogen in the shale is discussed. C. L. C.

The subsurface geology of the Big Lake oil field. E. H. Sellards and L. T. Patton. *Bull. Am. Assoc. Petr. Geol.* **10,** 365–81(1926).—In the majority of cases the oil occurs in an oölitic dolomite, and in all cases it occurs in strata closely related to this dolomite. The oölitic dolomite has certain characteristics by which it can be identified in dry holes as well as in producing wells, thus furnishing a reliable and easily identifiable key horizon. The formations contain large amts. of anhydrite, which occur

up to within short distances of the producing horizon, and these deposits of anhydrite are invariably wrongly identified by drillers as "lime," and mapping of subsurface structure by using the top of the "lime" as shown by the driller's logs is more or less unreliable, especially in territory where no production is found. The structure of the field as shown on the oölitic dolomite as identified in well samples is discussed. C. L. C.

Some features of red-bed bleaching. G. F. Moulton. *Bull. Am. Assoc. Petr. Geol.* **10,** 304–11(1926).—Field work in southern Montana has led to the discovery that in certain folds on the flanks of the Big Horn Mountains, the Chugwater red beds exposed along the crests of minor anticlines are bleached to a clean white color. Oil seeps were noted in the Chugwater sandstone at the south end of one of these anticlines along the Little Bighorn River. Later a much larger mass of oil-saturated rocks was found in the Chugwater formation on the Black dome, southeast of Bridger. These occurrences suggest that oil migrating through the sands causes a reduction of the Fe_2O_3 pigment to a sol. ferrous form in which soln. and removal take place. Lab expts. showed that no appreciable reduction took place unless the temp. was raised enough to cause cracking of the oil At such temps. the reaction was rapid. H_2S reduces Fe_2O_3 in the cold. In the bleaching near Bridger, H_2S is a possible agent, for in that locality a spring of water contg a large quantity of that gas was noted. H_2S is a common constituent of waters associated with oil. Such waters would probably follow or accompany oil escaping through fissures in an anticline. Therefore, although the bleaching is probably not due to the action of the oil itself on the Fe_2O_3, it may be considered as a phenomenon associated with the movement of oil through the rocks. Consequently any anticlines whose crests are marked by bleached red beds should be regarded with suspicion unless possibilities of production exist at a considerable depth. C. L. C.

Precious stones. G. F. Kunz. *Mineral Ind.* **34,** 590–616(1925).—A statistical review. A. B.

The petroliferous deposits of northern Germany. Elpidio Paparella. *Rass. min. met. chim.* **65,** 25–9, 51–7(1926).—The geology, methods of exploitation and systems of distn. are discussed, with a comparison between these and Italian methods. C. C. Davis

The recognition of minerals and the determination of their proportions in crushed rocks. Albert Johannsen and C. A. Merritt. *J. Geology* **34,** 462–5(1926).—The rocks are crushed so as to pass an 80-mesh but be caught on a 100-mesh sieve, treated for 7 min. with 50% HF, then washed and brought in contact for 10 min. with a strong soln. of gentian violet. The plagioclases are stained, the K feldspar is corroded but transparent while quartz is unaffected. The ferromagnesian minerals are recognized by their usual optical properties. The method can be made to yield quant. results. W. F. Hunt

Ore magmas of the plutonic rocks of the Ilmengebirge. P. N. Chirvinskii. *Verh. Russ. Min. Ges.* **54,** 37–50(1925); *Mineralog. Abstracts* **3,** 86.—From a consideration of all published chem. data, the average compn of the igneous rocks is calcd Magmatic differentiation assuming arbitrary amounts of volatile constituents is discussed. J. F. Schairer

The natural method in petrography. Intrusive eruptive rocks of the calco-alkaline series. J. M. Riba. *Mem. real acad. ciencias y artes* **19,** 1–178(1925).—A system of rock classification and dualistic nomenclature is developed which correlates and expresses the mineralogical and chem. compns. of the above rock types, and also the natural relations resulting from their differentiation and evolution from the magmas. A system of graphical representation of such relationships is presented. The artificiality of certain present systems of classification is pointed out. R. H. L.

Geological and petrographic studies in the Hercynian Mountains around Tiefenstein, southern Black Forest, Germany. S. K. Ray. *Private Publ.* **1925,** 111 pp.; *Mineralog. Abstracts* **3,** 88.—Ten new rock analyses and one of orthoclase are given. J. F. Schairer

Petrology of Penmaenmawr Mountain. II. Acid segregations and veins. H. C. Sargent. *Proc. Liverpool Geol. Soc.* **14,** 123–42(1925); *Mineralog. Abstracts* **3,** 89.—An analysis of segregations in the intrusive mass is given. The occurrence of segregations and veins is due to late concn. by volatile constituents of the magma. J. F. Schairer

Migmatic pegmatites of the Urals. A. E. Fersman. *Compt. rend. Aacd. Sci. Russia* **1925,** 69–72 (German); *Mineralog. Abstracts* **3,** 84.—Three types of pegmatites are distinguished: normal, contact and migmatic. In the last the migration of H,

Li, B, K, Na, F, Cl, S, P, Be, SiO_2 and Al_2O_3 from the pegmatite magma is very pronounced. J. F. SCHAIRER

Genesis of emerald deposits in the Urals. A. E. FERSMAN. *Compt. rend. acad. sci. Russia* **1925**, 57–60 (German); *Mineralog. Abstracts* **3**, 84.—There is evidence of a transfer of Si, O, H, Li, Be, F, K, Al from the pegmatite and of Ca, Mg, Fe, Cr, V, Mn, Ti from the surrounding rocks. J. F. SCHAIRER

Crystalline schists in the Krivoy-Rog ore-bearing district. V. E. TARASENKO. *Acta Univ. Voronegiencis* **1**, 265–89(1925); *Mineralog. Abstracts* **3**, 85.—Analyses of a riebeckite-tremolite rock, chloritoid-schist and *garnet* are given. J. F. SCHAIRER

Hydrogen sulfide in carboniferous limestones of the Donetz basin. Y. V. SAMOILOV AND V. A. ZILBERMINTZ. *Trans. Sci. Research Inst. Min. Petr. Physico.-Math. Faculty, First Moscow State Univ.* No. **1**, 31 pp. (1925); *Mineralog. Abstracts* **3**, 84.—Limestones were dissolved in HCl and the H_2S evolved detd. with Pb acetate paper. J. F. S.

Santorini eruption of 1925. H. S. WASHINGTON. *Bull. Geol. Soc. Am.* **37**, 349–84 (1926).—In thin section the groundmass is composed mostly of brown glass (n = 1.515) with numerous felt-like needles of plagioclase (albite-oligoclase), also microlites of pyroxene and grains of magnetite. Phenocrysts of labradorite (Ab_2An_3), augite and hypersthene were also observed. The rocks have been called hyalodacite as the norm shows over 10% quartz. Two new chem. analyses are given. W. F. HUNT

Microthermal observations of some oil shales and other carbonaceous rocks (STADNICHENKO, WHITE) **22**.

FERSMAN, A. E.: **Precious and Colored Stones of Russia.** Moscow: *Russ. Acad. Sci.* 386 pp. Reviewed in *Mineralog. Abstracts* **3**, 65.

HATCH, F. H.: **The Petrology of the Igneous Rocks.** 8th edit. revised with the assistance of A. K. Wells. London: G. Allen & Unwin. 566 pp. 144 figs. Reviewed in *Mineralog. Abstracts* **3**, 61.

LOEVINSON-LESSING, F. Y.: **Petrography.** Part I (introduction) (Russian). Leningrad (Sci. Chem.-Techn. Publications) 395 pp. Reveiwed in *Mineralog. Abstracts* **3**, 64.

NIGGLI, PAUL: **Versuch einer natürlichen Klassification der im weiteren Sinne magmatischen Erzlagerstätten.** Abhandlungen zur praktischen Geologie und Bergwirtschaftslehre, herausg. von G. Berg. Halle: (W. Knapp.) Vol. I, 69 pp., 11 figs. Reviewed in *Mineralog. Abstracts* **3**, 1.

ROSENBUSCH, H.: **Mikroskopische Physiographie der Mineralien und Gesteine. Band I. Zweite Hälfte, spezieller Teil. Die petrographisch wichtigen Mineralien.** 5th ed. by O. Mügge. Stuttgart: (E. Schweizerbart). 276 pp. Reviewed in *Mineralog. Abstracts* **3**, 1–2.

VERNADSKII, V. I.: **History of the Minerals of the Earth's Crust.** (Russian.) Vol. I, part 1. Leningrad, 208 pp. Reviewed in *Mineralog. Abstracts* **3**, 65.

9—METALLURGY AND METALLOGRAPHY

D. J. DEMOREST, ROBERT S. WILLIAMS

Zinc. J. A. ZOOK. *Mineral Ind.* **34**, 713–47(1925).—A review of the world's Zn industry, with statistics. A. B.

Metallurgy of zinc. W. R. INGALLS. *Mineral Ind.* **34**, 747–51(1925).—A review of recent progress. A. B.

Quicksilver. ANON. *Mineral Ind.* **34**, 617–24(1925).—Domestic and foreign production, markets and technology are reviewed. A. B.

Tin. E. B. SCOTT. *Mineral Ind.* **34**, 667–90(1925).—A review of the world's industry, including production, prices, and metallurgy. A. B.

Titanium and zirconium. J. W. MARDEN. *Mineral Ind.* **34**, 691–8(1925).—A discussion of production, uses and metallurgy. A. B.

Tungsten. C. G. FINK. *Mineral Ind.* **34**, 699–712(1925).—Domestic markets and supplies and foreign production are discussed, with notes on technology. A. B.

Antimony. K. C. LI. *Mineral Ind.* **34**, 52–61(1925).—A review of the world's production, trade and technology. A. B.

Gold and silver. M. W. VON BERNEWITZ. *Mineral Ind.* **34**, 287–357(1925).—Production and the economics of the industry in the U. S. and the world are reviewed and metallurgical developments are discussed. A. B.

Iron and steel. Edwin F. Cone. *Mineral Ind.* **34,** 372-426(1925).—A statistical review of the industry, with an outline of technical developments. A. B.

Lead. R. M. Santmyers. *Mineral Ind.* **34,** 427-53(1925).—Production and markets of Pb and compds. in the U. S. and foreign countries are discussed, with statistics. A. B.

Metallurgy of lead in 1925. O. C. Ralston. *Mineral Ind.* **34,** 453-66(1925).—A review. A. B.

Copper. W. H. Weed. *Mineral Ind.* **34,** 181-228(1925).—A statistical review of the industry. A. B.

The metallurgy of copper in 1925. L. S. Austin. *Mineral Ind.* **34,** 234-73(1925).—A review. A. B.

Copper alloys and utilization of copper. Wm. G. Schneider. *Mineral Ind.* **34,** 228-34(1925).—A discussion of consumption and uses. A. B.

Cobalt. C W Drury. *Mineral Ind* **34,** 177-80(1925).—Production, metallurgy and uses are discussed. A. B.

Chromium. Wm. D. Johnston, Jr *Mineral Ind.* **34,** 124-32(1925).—Production and technology of Cr and compds. are discussed. A. B.

Platinum. G. F. Kunz. *Mineral Ind* **34,** 560-78(1925).—Statistics are given of production and consumption of Pt and allied metals, with notes on technology and a bibliography. A. B.

Nickel. T. W. Gibson. *Mineral Ind* **34,** 504-13(1925).—Deposits, uses, and metallurgy of nickel are discussed, and production statistics given. A. B.

Manganese. C. H. Behre, Jr *Mineral Ind.* **34,** 473-86(1925).—B. discusses production, imports and prices of Mn and alloys, with bibliography. A. B.

Cadmium. C. P. Linville. *Mineral Ind.* **34,** 108-10(1925).—Statistics of production and trade are given A. B.

Bismuth. C. P. Linville. *Mineral Ind.* **34,** 101-2(1925).—A review of production A. B.

Molybdenum. Alan Kissock and J. D. Cutter. *Mineral Ind.* **34,** 495-7(1925).—A review of development of the industry, with production statistics. A. B.

Aluminum and bauxite. R. J. Anderson. *Mineral Ind.* **34,** 8-52(1925).—Production, trade and metallurgy of Al and alloys are discussed. A. B.

Ore roasting. Hans Fleissner. *Montan. Rundschau* **17,** 523-9(1925).—In discussing the roasting of $FeCO_3$ ores the equil relations in the system $CaCO_3$–CaO–CO_2 are first described and the beneficial effects are shown of reducing the partial pressure of CO_2 by use of steam or a neutral gas The decompn. of $FeCO_3$ is less simple and may be considered according to the 2 reactions (1) $FeCO_3 \longrightarrow FeO + CO_2$ and (2) $3\,FeO + CO_2 \rightleftharpoons Fe_3O_4 + CO$. The first reaction is aided by lowering the partial pressure of the CO_2 Expts carried out by leading CO_2, N_2, air and steam, resp , over powd. $FeCO_3$ showed that the decompn. began at a lower temp. range and proceeded more rapidly with N than with CO_2 alone; it goes better still with air, and best with steam. It was clearly shown not only that the lowering of the partial pressure aided the decompn. reaction but also that the kind of gas used was highly important A similar decompn. is shown to take place naturally in some ore deposits. The size of the ore particles is very important since it affects the rate of reactions. It is much better to roast each size by itself rather than to attempt to treat widely different sizes together. D. F. McFarland

Progress in ore dressing and coal washing in 1925. R. H. Richards and C. E. Locke. *Mineral Ind.* **34,** 752-812(1925) —A review of developments in crushing and grinding, screening, classifying, settling, amalgamation, magnetic concn., flotation ore dressing app. and theory and treatment of *coal,* with examples of practice and a bibliography. A. B.

Concentrating lead-silver ore at Hecla mine. W. L. Zeigler. *Eng. Min. J.* **122,** 444-50(1926).—Description of Hecla Mining Company's new concn. practice at Gem, Idaho Jigs and tables are used for making a coarse concentrate desirable for smelters. Flotation of old tailings contg. 1.1% Pb with a recovery of 89% has been successful. Hans C. Duus

Milling practice at the Homestake gold mine. E. H. Robie. *Eng. Mining J.* **122,** 564-8(1926).—Metallurgical data are given on stamp crushing, grinding and amalgamating. E. J. C.

Notes on manganese-bearing limes. R. A. Cooper. *J. Chem. Met. Soc. S. Africa* **26,** 315, 318(1926).—C. indicates the futility of using a Mn-bearing lime in the cyanide process for its available O. Mn probably exists in the original stone as MnO_2 and much of this is decomposed on calcination to form Mn_3O_4, which is inert

as regards oxidizing properties. Increased aeration will probably meet most needs in Witwatersrand practice, and more direct and efficient oxidizing agents, such as $KMnO_4$, $CaOCl_2$, etc., are available. W. H. BOYNTON

Production of antimony (regulus) in Wilhemsburg in the war-year 1915. FRANZ. BÖRNER. *Metall u. Erz* **22,** 559–64(1925).—Sulfide ore was roasted with Fe (45%) and alkali salt (10%), followed by raffination with charcoal and soda. In roasting there was a loss of about 9% Sb in the slag and 5% in dust. A further slag treatment with anthracite gave 99% Sb. C. G. KING

Reverberatory refining of copper—influence of prolonging the blowing upon the impurities in and properties of the metal. W. HECKMANN. *Metall u. Erz* **22,** 527–46 (1925).—Metallographic and chem. study showed that by prolonged blowing, the O content reached 0.80 to 0.85% in the form of Cu_2O, after which the other metals present were oxidized to form slag. C. G. KING

Desulfurizing action of manganese in iron. C. H. HERTY, JR. AND J. M. GAINES, JR. *Trans. Am. Inst. Mining Met. Eng.* **1926** (preprint), No. 1597-C, 1–6 pp.—Exptl. data on the elimination of S in the ladle show that if any S is eliminated, the final content of S and Mn is related as follows: product (% Mn)(% S) = 0.070, provided (% Mn) (% S) is greater than 0.07 at the furnace, and when no blast furnace slag is present on the iron. The higher the Mn the lower the S after the elimination has ceased. The relationship is shown graphically. The amt. of S eliminated from each ladle tested is shown. S elimination is shown to cease 1 hr. after pouring, and when the product (% Mn)(% S) is above 0 07 at the blast furnace, elimination of S will take place until equil. is established, if below 0.07 little or no elimination results. The presence of blast furnace slag in the ladle may cause reduction of S from the slag into the metal. If the MnS eliminated from the iron is poured into the open hearth the advantage of desulfurization by high Mn is lost. The initial and final values for Mn, S and temp. °F. for 20 casts and for time in the ladle for many of them are tabulated. W. H. B.

The production of steel in the Bosshardt furnace. F. GÜNTER. *Continental Met. Chem. Eng.* **1,** 3–6(1926).—The Bosshardt plant consists of an open-hearth furnace, resembling a Siemens-Martin furnace, of 3-tons capacity and is supplied with a gas producer at both sides of the hearth. Structural peculiarities include a rather steep angle of the air channel and of the roof walls a short distance behind the mouth of the air channel. These features increase the life of the roof. The roof is composed of specially shaped, highly refractory silica bricks and is laid without cementing of joints. Furnace walls have basic linings and 3 charging doors are provided. A few American installations are mentioned The ratio of yield point to tensile strength is almost 0.9 as compared to 0.6–0.65 in ordinary constructional steels. The main difference between them lies in the alloying constituents. If the Bosshardt steel is proved to be comparatively free of gas inclusions, its field of application will widen into the production of all kinds of alloy steels. W. H. BOYNTON

Future trends in iron and steel production. J. A. MATHEWS. *Ind. Eng. Chem.* **18,** 1021–3(1926). E. J. C.

Manufacture of forging steel by the basic open-hearth process. R. L. CAIN. *Trans. Am. Inst. Mining Met. Eng.* **1926** (preprint), No. 1591-C, 6 pp —A presentation of some of the controlling factors to be observed and precautions necessary in the manuf. of forging steel as related to materials and operations used for the basic open-hearth process. The points briefly considered are: (*a*) character of charge; (*b*) working of heat; (*c*) tapping and ladle addns.; (*d*) teeming, and (*e*) metallurgy. Serious consideration should be given to the effect which the charge, especially pig iron, has on the quality of steel produced. Drawings are shown of ingots poured straight up in a Gathmann mold, and in an inverted mold. W. H. BOYNTON

Specific efficiency of the blast furnace. RICHARD FRANCHOT. *Mining & Metallurgy* **7,** 368–74(1926). H. C. PARISH

Composition of iron-blast-furnace slags. R. S. MCCAFFERY, J. F. OESTERLE AND LEO SCHAPIRO. *Trans. Am. Inst. Mining Met. Eng.* **1926** (preprint), No. 1603-C, 1–37 pp.—A general study of slags. It is shown that there are 22 components which may enter into a SiO_2–Al_2O_3–CaO–MgO system, 10 or 12 of which may be present in blast-furnace slags which are within the ordinary ranges of compn. A theory is developed of the cooling of a 4-component soln. from the liquid state to the solid and is applied. A graphic representation of slags by means of tetrahedron is discussed and application of equilateral tetrahedron to a quaternary system is shown. Diagrams show the application: when binaries form eutectics, when one binary forms a compd. stable at its m. p., when the compd. is unstable at its m. p., and when one binary forms an isomorphous series and the others form eutectics. The path of crystn. is traced

in typical cases of 4-component systems, and a method is given of calcg. the percentages of mineral compds. present in the slag when the oxide percentages are known. Tables give the names and compn. of oxides and compds. which may enter into the compn. of slags, the tetrahedra within which ordinary blast-furnace slags occur, mineral compn. of slags, mineral compn. of 74 iron-blast-furnace slags, the furnace log and slag analyses.
W. H. BOYNTON

Future developments in the light metals. F. C. FRARY. *Ind. Eng. Chem.* **18,** 1016–9(1926). E. J. C.

The metallurgical plant at Tambang Sawah. M. H. CARON. *Jaarboek Mijnwezen* **53,** 218–35(1924).—The novel installation for Ag and Au recovery from manganese-silver ore (about 12 g. Au, 1100 g. Ag per ton), built in coöperation with the U. S. Bureau of Mines (cf. *Bull.* 226) is described; additional operation and construction data are given. The ore is crushed to 1″ size, reduced in "Clevenger" reducing ovens, ground in ball mills in mill soln to 97% 200-mesh with addition of fresh cyanide soln. and lime, then exhaustively extd. by counter-current decantation in 4 agitators and 6 thickeners and finally the tailings are removed by Oliver filtration. The clarified pregnant soln. from the ball mills is pptd. with Zn dust, the ppt. contg. the noble metals filtered off in Merrill presses. The alky. of the mill soln. was kept at 20 to 30% of a satd. lime soln., small lime additions were made to the last 3 agitators. The total NaCN losses are only 100 g per ton tailing. The Ag and Au extn. of the material were 87.7 and 97%, resp., with a consumption per kg Ag of 1 kg. NaCN and 0.6 kg. Zn dust (2.5 kg. CaO per ton ore). A best yield of 2.16 parts Ag per 1 part Zn could be reached; this invalidates Clennells hypothesis of a reaction according to $NaAg(CN)_2 + 2NaCN + Zn + H_2O = Na_2Zn(CN)_4 + Ag + H + NaOH$. Most likely $2\ NaAg(CN)_2 + Zn = Na_2Zn(CN)_4 + 2\ Ag$ takes place. In a new furnace (2% borax addition) 98% pure metal was obtained with a loss of only 0.56 and 0.74%, resp., of the Au and Ag. Formerly the losses ran as high as 3% in an older tilting furnace.
B. J. C. VAN DER HOEVEN

Pulverized fuel in metallurgical furnace practice. L. P. SIDNEY. *Metal Ind.* (London) **29,** 215–20(1926).—A brief description of the Buell pulverized-fuel system and its application in metallurgical practice. The defects existing in pulverized-fuel systems and the ideal requirements of such systems are pointed out. The fuel supply should be automatic and in the proper phys condition. The air supply should be susceptible of closest adjustment and control, a wide range of fuels should be utilizable and the size of the combustion chamber should be the smallest possible, and the flame should fill it equally and completely. A dispersive type burner in which the flame can be made very short and expands immediately on leaving the burner is best for metallurgical practice. Dispersive burners arranged for coal and for oil-firing are illus. and their operation explained. Claims for the Buell system are: elimination of dust, simple and elastic temp. control, and a material saving of fuel. Applications to reverberatory Sn smelting and to cupro-nickel are discussed. W. H. BOYNTON

Oil-fired open-hearth furnaces in steel foundries. ANON. *La fonderie moderne* **16,** 78–9, through *Feuerungstechnik* **13,** 258–9(1925).—Such furnaces, both acid and basic, are especially suited for sizes below 5 tons, and have numerous advantages, such as low S fuel, low first cost, small area and low labor cost. Two examples of the results attained are given. ERNEST W. THIELE

The drying of blast air through silica gel. F. KRULL. *Z. Ver. deut. Ing.* **70,** 907–10(1926).—A description and results are given of operating conditions on a blast furnace with and without drying with silica gel. Figures show the percentage increase in available heat from 1 kg. of coke in the blast furnace by using dry instead of wet air and the rate of absorption of water vapor by silica gel. Tables show the humidity of the air at different months of the year, moisture content of air satd. at different temp. and operating data on a week's production. The net saving on a ton of pig iron by using dry instead of wet air was 3.03 marks. L. A. PRIDGEON

A gas cupola using brown coal. ANON. *Feuerungstechnik* **13,** 268–9(1925).—The cupola described has a hearth at the lower end, in which the melted metal is further heated by the gas from the top. The air used to burn this gas is heated in a recuperator. Briquets are the fuel. ERNEST W. THIELE

The production of bronze alloys. E. R. THEWS. *Continental Met. Chem. Eng.* **1,** 7–8(1926).—The melting appliances necessary for the production of a satisfactory alloy, the requirements of the deoxidizing agents, and means of desulfurizing the metal are discussed. Characteristics of the deoxidizing agents are indicated. W. H. B.

Trend of development in the wrought-iron industry. JAMES ASTON. *Trans. Am. Inst. Mining Met. Eng.* **1926** (preprint), No. 1595-C, 13 pp. E. J. C.

Distortion of iron crystals. G. I. Taylor and C. F. Elam. *Proc. Roy. Soc.* (London) **112A**, 337–61(1926); cf. *C. A.* **19**, 2287.—Single crystals of Fe in bars of 2 mm.[2] diam. were marked and pulled in a tensile testing machine. Similarly small disks cut from a crystal of Fe were compressed. The distortion was measured and the results are plotted in stereographic diagrams. T. and E. conclude that the distortion of Fe crystals is different from that of other metals. There is cohesion in the form of rods or bundles of rods of irregular cross-section. Any slip lines appearing on a polished surface are the traces of these bundles on that surface. Under a uniform shear the bundles form plates of irregular thickness lying parallel to the plane of slip. The latter is detd. by the direction of principal stress and has no direct relationship with the crystal axes. Slip lines are the intersection of the plane of slip with the surface of the specimen and are not correlated with traces of crystal planes. The slip lines are curved in detail but have a general direction which coincides with the trace of the slip plane on the polished surface In agreement with this theory, crystals cut with a polished surface parallel to the direction of slip showed straight slip lines. When there is an appreciable angle between the polished surface and the direction of slip jagged or curved lines appear These, however, preserve a general direction, readily measured and in accordance with the detns. of the distortion. Several interesting photomicrographs are presented. H. S. van Klooster

The effect of occluded hydrogen on the tensile strength of iron. L. B. Pfeil. *Proc. Roy. Soc* (London) **112,** 182–95(1926).—Pickling processes are known to affect the mech properties of metals, and this has been ascribed to the presence of occluded H The expts. described show that the H has a remarkable weakening effect on the inter cryst. boundary, and also decreases the cohesion across the cubic cleavage planes. The H apparently has no important effect on movement along the slip planes. The effect of H on finely cryst. Fe is much less marked at temps. above room temp. Unless the pickling is continued during the stressing, the effect of the H was scarcely noticeable in tensile tests. A. W. Kenney

Thermal treatment of molten iron and its application to malleable cast iron. E. Piwowarsky. *Stahl u. Eisen* **45,** 2001–4(1925) —In agreement with P.'s observations on the influence of thermal treatment on fluid Fe (*C. A.* **20,** 3431), expts. on malleable irons of different compns showed that heating to 1400–1500° retarded decompn. of the carbide on subsequent annealing, the effect increasing with decreasing Si content. Heating to a lower temp. (about 1300°) or to a higher temp. (above 1500°) had the opposite tendency. These effects persisted even after annealing for 60 hrs. An Fe made by mixing 2 samples which has been heated to temps in the lower and higher temp zones showed after annealing greater carbide decompn. than a similar Fe which had been heated directly to approx. the same temp. (1450°) in the intermediate zone. As the temp. to which the fluid Fe was heated was raised the temper C subsequently deposited became finer but not to the same degree as in the expts. with gray Fe. Annealing above 900° gave finer distribution of the temper C although the rate of carbide decompn was not accelerated. Annealing at about 800° produced no refinement of temper C but increased the rate of graphite crystn. By combining these annealing treatments additive effects were produced. B. C. A.

Heat-treatment data on quality steel castings. A. E. White. *Mech. Eng.* **48,** 497–500(1926).—Normalized and drawn castings intended for power-plant purposes have properties superior to those produced by the standard anneal. The method consists in evenly heating the castings between 1750° and 1800° F. and holding them within this temp. range until uniformly heated. They should then be cooled to 100° F. or below in still air. The castings should then be uniformly heated to 1200° F., after which they may be cooled as desired. H. C. Parish

The best press temperature of ($\alpha + \beta$)-brass. W. Schreiter. *Z. Metallkunde* **18,** 285–7(1926).—The most favorable press temps. are given for a few metals as follows: Zn, 90–120° or 140–160°; Al and Al alloys contg. up to 4% Cu, 15% Zn and a small quantity of Mg—400°. Brass contg. 61.5% Cu was pressed at 740°, 750° and 760°, and its mech. properties were then detd. Pressed at 740°, it showed a tensile strength of 40 kg./sq. mm. with 32% elongation; at 750° the tensile strength was 42.7 kg./sq. mm. and elongation 33.7%; at 760° the tensile strength was 43 kg./sq. mm. and elongation 41%. Photomicrographs are shown of the press pieces, and are taken at each end and in the middle of the specimens. Pressed at 740°, the crystals are arranged in rows or lines throughout the piece. At 750°, the line structure is found in that section first coming from the press, while the middle section shows coarse grains with no directional arrangement, and in the last section the structure is quite indistinct. At 760°, the coarse grain structure is found in the first and middle sections, with no

istinct structure in the last section. Thermal analysis shows that at 758° the transormation β to $\alpha + \beta$ commences, and the most favorable pressing temps. are in this icinity. This should not be greatly exceeded, to avoid loss of Zn. The upper limit s about 770–780°. H. STOERTZ

The structure and properties of red brass. R. KÜHNEL. *Z. Metallkunde* **18,** 273–8(1926).—This alloy, as used in the railway industry, generally has the compn.: Cu—85, Sn—9 and Zn—6%. No harm is caused by an As content up to 0.3, Pb up to 1, and Bi up to 0.1%. The most favorable proportion of Zn is between 4 and 6%. Small quantities of S are very harmful, because of the formation of sulfide inclusions, these being visible in photomicrographs with only 0.02% S. A discussion is given of the mechanism of cooling, and the extent of sepn. of the various constituents during cooling. If the cooling is too rapid, the pressure of the already crystd. outside layer upon the still liquid inner part causes some of this to be forced out in the form of drops upon the surface of the casting. Equil. diagrams are shown H. STOERTZ

Tensile strength and hardness of light metals and brass. RICHARD BAUMANN. *Z. Ver. deut. Ing.* **70,** 1225–9(1926).—A study is made of Al, *duralumin* and *brass* contg. 32 and 38% Zn, and a simple mathematical relation is found between hardness (either Brinell or impact) and tensile strength Having detd the hardness, it is only necessary to multiply by a factor to calc. the tensile strength For annealed duralumin, with a load of 3000 kg. in the Brinell test, this factor is about 36; for Al it is about 35 with a load in the Brinell test of 1000 kg and a sheet 17 mm. thick; for brass (32% Zn) it is 53.5 with a load in Brinell test of 1000 and with impact method of testing and a sheet thickness of 8 mm., while for brass (38% Zn) it is 57.2 under the same conditions by the Brinell test and 59.4 by the impact test H. STOERTZ

Heat treatment improves bronzes. N. K. B. PATCH. *Iron Age* **118,** 841–2(1926).—Heat treatment of bronzes consists essentially of the same operations as the heat treatment of steels. Color is not a guide as in steels, but the same powerful influence upon the resulting product is found here in the effect of the admixture of small amts. of ingredients Photomicrographs of an Al bronze contg 10% Al and 1% Fe are shown, taken before and after heat treatment The following data are given for an Al bronze, sand-cast with and without heat treatment (details of heat treatment not given): ultimate tensile strength, 60 to 75,000 lb./sq in , not heat treated (1), 80 to 93,000 lb /sq. in. heat treated (2); proportional limit in tension, (1) 10 to 11,000 lb /sq in., (2) 38 to 40,000 lb /sq in ; yield point in tension (1) 22 to 26,000 lb./sq. in., (2) 50 to 60,000 lb /sq in.; elongation in 2 in , (1) 15 to 25%, (2) 4 to 10%; compression under 100,000 lb. load, (1) 0.13 to 0.16 in., (2) 0.05 in.; Brinell hardness, (1) 500 kg. load, 90 to 100, (2) 3000 kg. load, 170 to 200. H. STOERTZ

Interatomic forces and the strength of metals. ANON. *Engineer* **142,** 309–10 (1926).—Many properties of metals are influenced by their polycryst character. Calcns. and theories based on the nature and magnitude of interatomic forces can be applied only to single crystals. A theoretical understanding of the strength and elasticity of single cryst. specimens must precede a complete understanding of the behavior of ordinary polycryst. metals. D. B. DILL

The determination of breaking strength from proportional elongation. P. LUDWIK. *Z. Metallkunde* **18,** 269–72(1926).—The usual method of detg. ultimate breaking strength by measuring the cross-sectional area of the specimen at the fracture and the load at the instant of fracture is very inaccurate, especially for metals which exhibit considerable reduction in area at the point of fracture. L. gives a formula for detg. ultimate breaking strength mathematically: $\sigma_B = K_z(1 + \delta_A)[2 - (1 + \delta_A)(1 - \psi_B)]$, in which σ_B is the strength at fracture in kg./sq. mm., K_z is the tensile strength at the limit of proportionality, δ_A is the proportional elongation, and ψ_B is the reduction in area of cross-section at the fracture. Should ψ_e, the reduction in area of cross-section at that load where this ceases to be proportional, be greater than 50%, the value obtained from the above equation should be increased by a percentage equal to the amt. ψ_e is greater than 50%. Thus if ψ_e is 65.7%, the value obtained for σ_B should be multiplied by the factor 1.157. The values obtained with a no. of metals and alloys are given, and are in general in good agreement with those experimentally obtained, the difference being less than 6% in all cases except a hardened Ni steel, which shows a calcd. value of 225.0 kg./sq. mm. as compared with an observed value of 206.0 kg./sq. mm., a difference of 9.2%. H. STOERTZ

The spheroidizing of cementite. BRADLEY STOUGHTON AND R. D. BILLINGER. *Ind. Eng. Chem.* **18,** 785–8(1926).—The previous literature on the spheroidizing of cementite is reviewed. Steels of 0.45, 0.8 and 1.4% C were heated for several hrs.,

both at the Ac_1 point, just below it, and just above it, and cooled in the furnace. The resulting structures are described and illustrated by photomicrographs Spheroidization was effected at temps. between 685° and 760°, in hypereutectoid steel, or from 30° below Ac_1 to 70° above it. All the specimens could be spheroidized below Ac_1, giving a lower Brinell hardness. G. F. C.

Bearing metals. R. T. ROLFE. *J. Inst. Metals* **35**, 439-40(1926).—The effect of Cu on white metals in preventing segregation is illustrated. Tables show the influence of casting temp. and mold temp. on tensile strength and on compressive strength to produce crushing. H. S. v. K.

The cracking of rolled and drawn material. W. MAYER. *Continental Met. Chem. Eng.* **1**, 9-10(1926).—It is graphically indicated how the defects occurring in rolling and drawing are due mainly to the setting up of internal strains Correct mech. treatment and suitable reheating methods are necessary. When intercryst. structure has been destroyed and the metal has lost its elasticity, the metal must be annealed. W. H. BOYNTON

Standardization of microscopic examinations of Muntz metal alloys. R. S. PRATT. *Mining & Metallurgy* **7**, 374-5(1926).—Sketches show 4 typical formations of the α- and β-constituents in Muntz metal as they appear when examd. on both cross-section and longitudinal section. They are designated as classes *A*, *B*, *C* and *D*. With little instruction routine operators are able to make a large proportion of needed microscopic examns. H. C. PARISH

Electrical properties of copper-nickel resistance alloys (in English). S. KIMURA AND Z. ISAWA. *Researches Electrotechn. Lab. Japan* No. **171**, 10 pp.(1926).—The relation between the elec resistance and the temp and chem. compn. of Cu-Ni alloys has been studied. The resistance change with temp. is measured from —200° to 800° for alloys of various Ni contents; the resistivity-temp. curve of the alloys in a certain range of Ni content has one max. and one min. This mode of resistance change is somewhat similar to those of the Ni-Cr alloys and the Cu-Mn alloys in a certain range of compn., and it seems to be a general property of solid solns. of some compns. According to the authors' opinion the exptl. results are yet insufficient to proclaim this generality and to propose a theory. The following facts, however, can be stated now: (1) The cause which makes the temp. coeff. of Cu-Ni alloys negative should have a close connection with the A_2 transformation of Ni, because it is fairly evident that this cause ends at about 390°, the Curie point of Ni, for all alloys of different Ni contents. (2) This resistance change with temp is entirely reversible and it is clear that this is of the same nature as A_2 transformation. (3) In the case of high-Ni alloys the temp. from which the lowering of the temp. coeff. becomes conspicuous nearly coincides with Curie points, but in the case of low-Ni alloys there is a large discrepancy between them and the lower the Ni content is the greater this discrepancy becomes. It is an unsolved question whether the Cu-Ni alloys make a series of continuous solid solns. or not. The authors discuss the problem in detail and suggest that to solve this question attention must be paid to the following points: (1) The samples must be pure in extreme degree; (2) it should be decided how Curie points are to be detd. from susceptibility-temp. curves. W. OGAWA

Electrical conductivity of certain light aluminum alloys and copper conductors as affected by atmospheric exposure. E. WILSON. *J. Inst. Elec. Eng.* (London) **63**, 108-[illegible](1925); *Brit. Chem. Abs.* **1926B**, 16.—A study of the effect of atm. exposure over a 4-yr. period on the elec. cond. of some light Al alloys contg. Cu, Ni, Mn and Zn in percentages up to 1-2%. Alloys contg. Cu alone or Cu and Mn show continuous diminishing of cond , which is more rapid the higher the Cu content. With Cu and Ni, or Cu and Zn or all three, the cond. decreases and then increases to an approx. const. value. An alloy contg. 1.08% Cu and 1.29% Ni showed a cond. drop to 84%, which recovered to 88.5% of its original value after 24 hrs. The percentage increase in elec. [illegible] of annealed high-cond. Cu is greater during the first yr. than for hard-drawn [illegible]ter 4 yrs. the percentage increase is lower in the latter case while after storage [illegible]uring 6 yrs. a small diminution in elec. resistance is noted. W. H. BOYNTON

[illegible]al conductivity of industrial non-ferrous alloys. J. W. DONALDSON. *En-[illegible]* **120**, 311-2(1925); *J. Inst. Metal.* (advance proof) Sept., 1925, No. **6**, 11 pp.—[illegible]al cond. *K*, that is, the quantity of heat transmitted per sec. through a plate [illegible]k per sq. cm. of its surface, where the difference of temp. between the 2 faces [illegible]ate was measured directly. *Results:* 70:30 Brass K = 0.242 at 90°, [illegible]t 429°. Mn bronze K = 0.171 at 81°, =214 at 425°. Gunmetal K = [illegible]88°, =0.193 at 418°. Admiralty gunmetal 80:10:2 K = 0.137 at 84°,

=0.172 at 418°. Phosphor bronze K = 0.129 at 95°, =0.174 at 431°. Monel K = 0.067 at 88°, =0.084 at 415°. White bearing metal K = 0.72 at 80°, about 0.096 at about 160°. F. R. Bichowsky

Cementation of ferrous and cuprous alloys by means of tungsten, molybdenum and tantalum. J. Laissus. *Compt. rend.* **182**, 1152-4, cf. *C. A.* **20**, 567, 3426.—Micrographic examn. of ordinary case-hardening steel (C 0.15%) which had been cemented with Fe-Mo (C 1.86, Mo 71.85%) under the same conditions as in the previous expts. showed the presence, from the inside outwards, of (1) a zone of solid soln. (disappearance of pearlite), (2) a brilliant external layer consisting of a solid soln. and a compd. (probably Fe_3Mo_2). The line of demarcation between the two layers is not sharp for cementations carried out at 1000° or under. The thickness of the layers increases with the time and temp. of treatment and decreases with increase in C content of the steel. The cemented steel can take a high polish. Treatment under similar conditions with Fe-Ta (C 1.00, Ta 29.26, Si 1.96%) gives, from the inside outwards, (1) a zone of solid soln. (disappearance of pearlite), which decreases in thickness with increase in time and temp. of treatment, (2) a 2nd zone of solid soln., more easily etched than the first, the thickness of which increases with time and temp. of treatment, and which, with cementing temps. of 1000° and over, contains eutectoid. Micrographic examn. of electrolytic Cu and of brass (71% Cu) which had been treated with Fe-W, Fe-Mo, and Fe-Ta showed that cementation had penetrated to a considerable depth, but the structure of the cemented layers has not yet been elucidated.
A. Papineau-Couture

Corrosion of nickel-alloy singe rolls. J. T. Travis. *Am. Dyestuff Rept.* **15**, 601-5(1926).—The corrosion is caused by $ZnCl_2$, or sometimes $CaCl_2$ or $MgCl_2$ in the sizing. During the singeing process the heat and moisture produce HCl from these chlorides. If $ZnCl_2$ is used the fabric should be washed in boiling water previous to singeing. L. W. Riggs

Oxidic salt tests and intercrystalline corrosion with aluminum and its alloys. H. Biegler. *Z. Metallkunde* **18**, 288-9(1926). This is a study of the intercryst. corrosion produced on Al and Al alloys by the oxidic salt test of Mylius. One set of tests was run on pickled specimens, and the other on specimens still protected by the skin effect produced in rolling, and the progress of the corrosion was detd. by means of bending tests and loss in wt.; the specimens were tested daily and then put into fresh solns. Loss in wt. is plotted against time of action. In the Al alloy (compn. not given) the action increases rapidly at first, rising on the pickled specimen from about 30 g./sq. m. per day loss in the 1st day to about 39 g./sq. m. per day after 2 days, and then rapidly falling until after 7 days the loss is only about 7.5 g./sq. m. per day. The unpickled specimen starts at 7 g./sq. m. per day and rises to 23 g./sq. m. per day at the end of the 2nd day, continuing to rise until it reaches a max. after 4 days of about 28 g./sq. m. per day, after which it falls, becoming const. at the value of nearly 15 g./sq. m. per day after 7 days. In pure Al, pickled, the attack is very strong at first, but quickly falls from a loss of about 18 g./sq. m. per day after 1 day to 5 g./sq. m. per day after 2 days, and then remains nearly const., being only slightly more than 5 g./sq. m. per day after 5 days. The unpickled specimen starts at about 6 g./sq. m. per day and rises slowly, showing a loss after 7 days of about 8.5 g./sq. m. per day. A photomicrograph is shown. H. Stoertz

Corrosion. H. Zurlinden. *Wochbl. Papierfabr.* **57**, 747-9(1926).—Modern corrosion theories are briefly discussed. Dissolved O in water can be removed (1) by heating, (2) by vacuum, and (3) by chem. combination with a specially prepd. Mn-steel wool. J. L. Parsons

Stress-strain cycle relationship and corrosion fatigue of metals. D. J. McAdam, Jr. *Proc. Am. Soc. Testing Materials* **1926** (preprint), No. 33, 31 pp.—Fatigue tests of Monel metal, ingot iron, stainless iron and alloy steels from 10^8 to 10^8 cycles show effects of temp., cold working and cycle frequency. Increasing rate of heat removal at high cycle frequency by water cooling changes the stress-strain-cycle relationship. Slight corrosion so weakens steel that in mechanical practice the corrosion fatigue limit rather than the endurance limit is important. E. L. Chappell

Metallographic studies on corrosion in the pulp and paper industry and wood grinders. V. Lindt. Tech.-Wiss. Teil, *Papierfabr.* **24**, 513-5, 534-9(1926).—An address covering corrosion studies with especial reference to the pulp and paper industry. Photomicrographs are shown. Corrosion is often caused by such chemicals as HCOOH, $MgCl_2$ and sulfite liquor, but is perhaps more often influenced by the kind and compn. of the metal. J. L. Parsons

Foundry refractories (BOOZE) **19.** The chemistry of metallic systems (WESTGREN, PHRAGMÉN) **2.** Reactions between solid phases. V. The reactions of the alkaline earths with sulfides, carbides, silicides and phosphides (HEDVALL, NORSTRÖM) **2.** Unmixing of supersaturated mixed crystals (FRAENKEL) **2.** Effect of tension on certain elastic properties of wires (EDWARDS, *et al.*) **2.** Cleaning articles of non-ferrous metals (U. S. pat. 1,601,511) **4.** Heat treatment of Mn steel castings (Brit. pat. 242,322) **4.**

Concentrating ores by flotation. F. G. MOSES and E. J. CANAVAN. Brit. 243,383, Nov. 22, 1924. In prepg. oils for use in flotation sepns., coal tar oils such as creosote or creosote oils contg. phenols or cresols are treated with a sulfidizing agent such as S_2Cl_2; or, tar acids may be treated with a sulfidizing agent and then mixed with tar oils.

Apparatus (with oscillating table) for ore concentration. J. F. REILLY. U. S. 1,603,213, Oct. 12.

Pneumatic flotation apparatus. O. H. JOHNSON. U. S. 1,601,860, Oct. 5.

Leaf filters for treating solutions for gold and silver recovery or for other purposes. L. D. MILLS and T. B. CROWE. Brit. 242,383, Sept 3, 1924.

Treating copper ores. W. E. GREENAWALT U. S. 1,602,795, Oct. 12. Cu ore is concd. to form a relatively small quantity of high-grade sulfide concentrate and a relatively large quantity of low-grade concentrate, the low-grade concentrate is roasted and leached with a suitable solvent for Cu such as dil. acid and the high-grade concentrate is heated to dissoc. the combined Cu and S and the S vapor thus formed is treated with a H-contg. gas to produce H_2S and the latter is used to ppt. Cu from the leach soln. Cf. *C. A.* **20,** 1586.

Extracting copper and other metals with ammonia solution. W. G. PERKINS and METALS PRODUCTION, LTD. Brit. 243,075, Aug. 22, 1924. In the extn of Cu, Zn and like metals from ores by NH_3 soln. contg. some CO_2, the material, after the leaching liquor is drawn off, is treated with a previously made mixt. of steam and NH_3 with or without CO_2. The vapors condense on the ore and wash out the remaining solvent without causing any pptn. of metal oxide on the ore. Numerous details are specified Cf *C. A.* **19,** 630.

Recovering gold and other precious metals. R. R. CAME, H. C. BOOTH and BRITISH VACUUM CLEANER & ENGINEERING CO., LTD. Brit. 242,372, Aug. 19, 1924. An air suction device is employed for taking up particles of Au or other metal from a deposit The app. may deliver to a vat contg. cyanide soln. or other chemical reagent for recovery of the metal.

Producing iron in blast furnaces. J. G. AARTS. U. S. 1,601,015, Sept. 28. Ore is fed downwardly through a blast furnace in an ore shaft out of contact with solid fuel and fuel is fed downwardly through the furnace in a fuel chamber in which it is subjected to fractional distn. and coking. Steam is passed into the lower portion of the fuel chamber and gas from the upper part of the fuel chamber is supplied to the lower portion of the ore shaft for reduction of the grains of ore to sponge Fe. The reduced ore is brought into contact with coke produced in the fuel chamber in the bosh of the furnace so as to melt down the Fe and simultaneously carburize it.

Apparatus for operating bell valves of blast furnaces and similar devices. J. A. MORRISON. U. S. 1,601,639, Sept. 28.

Open-hearth furnaces. S. NAISMITH. Brit. 242,607, Nov. 10, 1924.

Metallurgical hearth furnace. A. BREITENBACH. Brit. 243,402, June 25, 1924

Chrome steel. B. D. SAKLATWALLA. U. S. 1,601,541, Sept. 28. The major portion or all of the Cr is introduced into the steel by forming a molten bath of steel having a metal layer contg. C as the major reducing agent in a quantity adjusted according to the desired Cr content of the steel and a slag layer in which is incorporated Cr ore. This bath is maintained in molten condition to effect reaction between the C of the metal layer and the Cr ore in the slag layer. Cf. *C. A.* **20,** 3278, 3279

Heat treatment of high-speed steel. GLOCKENSTAHLWERKE AKT.-GES. VORM. R. LINDENBERG. Brit. 242,421, Oct. 23, 1924. In the heat treatment of high-speed steel, which may contain Co, for the manuf. of permanent magnets, the steel is heated to a temp. above the so-called lowering point and is then quenched in oil, petroleum or other "mild hardening mediums which do not contain H_2O." By the "lowering temp." is meant that temp. to which certain steels have to be heated in order that the Ar_1 temp. shall be lowered when the steel cools. A steel contg. C 0.6–0.8, Mn 0.5, Si 0.25, Cr 4–5, Mo 7–8, Co 1–2 and V 0.5 may be heated to 1150° and then quenched in oil. Other steels are also referred to in detail.

Refining steel. J. N. Kilby and A. H. Spalton. Brit. 242,475, May 6, 1924 Steel after it leaves the furnace is poured into a container with a lining of refining medium and similar refining substances are also added in powd. or molten form so that the steel is completely enclosed in the refining materials. A suitable lining may comprise a mixt. of magnesite 75 and dolomite 25% and the added compn. may be of different compn., comprising, *e. g.*, fluorspar 2, lime 2, silica 1 and borax glass 1 part.

Detempering steel. E. J. Lewis. U. S. 1,602,274, Oct. 5. Hard steel is softened by heating to about 410° and then quenching in an aq. soln. contg. Na_2CO_3 3 lbs and soap 4 oz to each 5 gals of H_2O.

Case-hardening steel. Rheinische Metallwaaren- und Maschinenfabrik Brit. 242,978, Nov 17, 1924 Only the external layer of a steel article which has been carburized is subjected to the hardening temp, preferably by immersion in a highly heated Pb or salt bath

Hardening cast iron. British Perlit Iron Co, Ltd. Brit. 242,613, Nov. 10, 1924. Cast Fe of substantially uniform pearlitic structure as prepd. by processes such as described in Brit. pats Nos 147,933 (*C A* **15**, 51), 210,091 (*C. A.* **18**, 1640), 217,885 (*C A.* **19**, 235) or 225,501 (*C. A* **19**, 1554) is hardened by a heat-treatment similar to that used for steel The cast Fe may have preliminarily incorporated with it improving agents such as Ni, Ti, W or Cr and is suitable for the manuf of cutting tools

Reducing iron and other metals. H G Flodin and E. G. T. Gustafsson. Brit 243,353, Nov 19, 1924 In producing Fe or other C-binding metals and alloys, briquets or lumps contg. ore and C are mixed with an assocd charge richer in C and the mixt is heated, preferably in an elec furnace, to produce a product of desired C content Before tapping the metal from the furnace it may be deoxidized and recarbonized by adding a mixt of finely divided oxide ore or a deoxidizing metal such as Mn and finely divided C Cf *C A.* **20**, 2111

Softening aluminum-plated iron articles. F. Jordan. Brit. 243,042, June 2, 1924. See U. S 1,552,744 (*C A* **19**, 3475)

Molds for iron castings. Compagnie générale des conduites d'eau. Brit 242,617, Nov 4, 1924 A centrifugal or other mold for making unhardened Fe castings is wholly or partly lined with Si, ferro Si or other Si-contg material, which may be mixed with an org binder such as gluten, linseed oil, molasses, resin, varnish, dextrin or flour

Photographic reproductions in enamel on metals. R. W. Carter. Brit. 243,61[illegible] Apr. 29, 1925 A metal plate which may be formed of a Ni, Al or Cu alloy which will not discolor at a temp. of 815° has a photographic image formed and developed upon it and the design is rendered more permanent by fusing into it an enamel of about the same coeff of expansion as that of the metal SiO_2 and Ir black may be used for the enamel.

Pickling metals. W. Thomas and M. Hawes. Brit. 242,506, March 13, 192[illegible] A pickling soln for metal plates is prepd by dilg ordinary com H_2SO_4 and then adding NaCl and Zn (the latter causing "a gentle seething" of the soln. for about 1 hr.) The soln is allowed to stand several days to effect clarification and is then used at a temp of about 40°.

Casting metals. S. Buchalo and A. Haefeli. Brit. 243,299, Nov. 20, 192[illegible] The mech. properties of cast metal are stated to be improved by controlling the cryst of the cooling mass by imparting to it direct or transmitted vibrations

Apparatus for quenching, pickling and washing metal articles or other materials E. G. Greene. U. S. 1,601,497, Sept 28

Furnace for heat-treating metal articles. H. O. Swoboda and E. M. Richar[illegible] U. S. 1,603,165, Oct. 12.

Nickel alloy. T. S Fuller. Can 263,954, Aug. 31, 1926. An alloy compr[illegible] by weight about $^2/_3$ Ni and $^1/_3$ Cu, and contains about 2.5% Al and about 0.16[illegible] It has when forged an elasticity equal to high-grade steel.

Aluminum alloys. A. Pacz. U. S. 1,595,058, Aug. 3. Alloys which may have their grain refined by processes such as that of U S pat. 1,410,461 (*C. A.* **16**, 17[illegible]) comprise Al together with Si 3-15, Cu 1 0-1.5 and Mn 0 5%, with or without small quantities of Co, U, W, or Mo Cf. *C. A.* **20**, 3279.

Bearing metal alloy. K. Muller and W. Sander. Can. 263,856, Aug. 31, 19[illegible] A bearing metal alloy contains Pb not less than 70%, Sb not less than approx 1[illegible] and Sn not more than about 6%, and relatively very small addns of metals of the group and Cu, the eutectic ground mass being hardened by the addn. of small quanti[illegible] of Cd.

Steel alloy. J. W. Weitzenkorn. U. S. 1,601,787, Oct. 5.
for making rolls for steel mills contains C 0.85–2.50, Mn 1.15–3.00
Steel alloys. F. Krupp Akt.-Ges. Brit. 243,613, May
hardened in their marginal layers by nitrogenization as descri
174,580 (*C. A.* **16,** 1738) are made from steel alloys contg. 0.5–2.
C and a total of 0.5–4.0% of Si, Mn, Ni, Cr, Mo, W, V, Ti and Z
Aluminum-copper alloys. British Aluminum Co., Ltd.,
H. W. L. Phillips. Brit. 243,405, July 19, 1924. The struc
which may also contain Mn or Mn and Ni is modified by the add
of 5% of NaF or 0.2% of Ca. Alkali or alk. earth metals, th
or fluorides or compds. such as sodamide are also suitable and
as As, Sb, Al, Mg, NaCl and alkali and alk earth metal peroxide
The treating agent may be wrapped in Al foil previous to its addn
Cerium alloys for igniting purposes. A. Kratky. Brit. 2
Ce is alloyed with 10–25% of Si or Si and B, together with glass
such as K, Na, Zn, Ca, Al and Pb.
Annealing alloys. Y. L. La Cour and F. O. M. Lindh. B
1924. Alloys consisting mainly of Cu, Zn, Sn, Pb and Al (or s
are slowly heated in an elec. furnace to the max. annealing te
cooled (preferably in the furnace) to a temp., *e. g.*, below 75% of t
exposure to the air for further cooling. Inert gases may be suppl
exclude air or charcoal may be placed in the furnace to absorb O
Alloy for high-speed tools. W. A. Wissler. U. S. 1,602,99
high-speed cutting of cast Fe are formed of an alloy contg. at leas
10% of another metal of the Cr group such as W, and at least 0.4
of the alloy being principally Co.
Molding sand. W. B. Runyan. U. S. 1,602,412, Oct. 12.
is treated to restore its binding properties by sprinkling it with a
divided plastic clay in H_2O to coat the grains of sand with the cl
Ductile bodies of refractory metals. A. E. van Arkel. U.
A single crystal of a metal such as W is heated in an atm. of W chlo
volatile and dissociable compd., at a temp. between that at whi
ciates and that at which the dissocd. metal ceases to associate w
crystal (about 1200–2400° with W and W chloride) in order to enla
and adapt it for hammering, rolling or drawing.
Reducing refractory metal oxides. J. W. Marden. U. S.
Refractory metal powders such as Zr, Ti, Th, U, W, or Mo are prod
their compds. with Mg in an inert environment in a closed contain
Rust-proofing metals. M. A. Atuesta and C. E. Jones.
10, 1924 Trolley wire hangers or other metal articles are protected
layer of Cd or Zn over which a layer of Sn is deposited. Both laye
electrolytically.

10—ORGANIC CHEMISTRY

CHAS. A. ROUILLER AND CLARENCE J. WEST

Future trends in synthetic organic chemistry. Chas. H.
Chem. **18,** 1025–7(1926).
Indirect interatomic effects in organic compounds. F. Sw
Chim. Inst. Intern. Chim. Solvay **1926,** 199–236.—A review and
hindrance and of various theories advanced to explain the effects
radicals when present in a mol. on the remaining portion of the mol
ject by taking various examples of the effects of atoms or groups
the benzene ring and discussing them in the light of theories a
authors. He does not consider that the theory of influence throug
theory of influence through the intervention of electrons in dire
atoms or groups affected, are mutually exclusive; and it is therefore
both. *Ibid* 237–46.—Discussion by F. Swarts, Armstrong, F. M.
and T. M. Lowry. A. Pa
**Effects exerted by atoms and groups of atoms on the reactivit
on the strength of bonds within the molecules.** M. Tiffenea
2ième Cons. Chim. Inst. Intern. Chim. Solvay **1926,** 247–321.—A re
general classification of methods used or proposed for detg. the rel

affinitive capacities of various radicals and of the strength of their bonds; (2) systematic description of these various methods with a critical discussion of their value; (3) outline of present data on migratory tendencies and their consequences as regards affinitive capacities; (4) general discussion of established facts and general conclusions. The latter are as follows: (1) Cyclic radicals (C_6H_6 type) always have affinitive capacities, bond strengths and migratory tendencies which are much higher than those of acyclic, hydrocyclic and mixed radicals. (2) Introduction of substituting groups into the C_6H_6 nucleus modifies all 3 properties more or less, sometimes increasing and sometimes decreasing them (3) Me slightly increases affinitive capacity in *o* or *p* position, and has an almost negligible effect in *m* position (4) OMe increases the affinitive capacity very considerably when it is in *p*, much less in *o*, and has but little effect in *m* (5) Cl very slightly increases affinitive capacity when substituted in *o*, and decreases it when in *m* or *p* (6) Br decreases the affinitive capacity in all 3 positions, and most when in *m* (7) I increases affinitive capacity when in *o* or *p*, and decreases appreciably in *m* (8) NO_2 causes an enormous increase in affinitive capacity when in *p* (this group is the most active of all those studied to date), and decreases it considerably when in *m* (9) COOH has a slight weakening action in *p* position (10) The 2 naphthyl groups have a greater affinitive capacity than Ph, that of the α being appreciably greater than that of the β (11) In all cases substitution in the *m*-position has a clearly unfavorable effect (12) The affinitive capacity of C_4H_3S is much lower than that of Ph. (13) As regards migratory tendencies, the radicals fall into 2 groups, cyclic on the one hand, acyclic and mixed on the other (14) Radicals of the first group always have much higher migratory tendencies than those of the 2nd. (15) The migratory tendencies of mixed radicals are intermediate between those of cyclic and acyclic radicals (16) The migratory tendencies of cyclic radicals seem to vary with their affinitive capacities (17) The migratory tendencies of acyclic radicals seem to vary inversely as their affinitive capacities A. PAPINEAU-COUTURE

The polarization of the hydrogen atom in organic compounds. A E VAN ARKEL AND J H DE BOER *Z physik Chem* **122**, 101-12(1926) —Such properties as b p, mol vol and cohesion pressure of isomeric org. halogen compds do not depend so much on the position of the halide as on that of the H The position and no of H atoms det their polarization Some authors assume a homopolar combination for H or Cl attached to C but since the properties of C compds gradually shade over into those of Si, Ge, Sn, etc, H and Cl must continue to be homopolar It is believed more advantageous to assume various degrees of heteropolarity. R H LAMBERT

The reduction of carbon monoxide. O C. ELVINS AND A. W. NASH *Nature* **118**, 154(1926) The formation of hydrocarbons by passing a mixt of CO and H at atm pressure over catalysts has been described by F Fischer (cf. *C. A.* **20**, 2065) E. and N have confirmed the formation of liquid hydrocarbons and also have shown the possibility of the synthesis of oxygenated compds A mixt. of 53 9% CO and 44 6% H at atm pressure was passed over reduced oxides of Mn, Co and Cu, impregnated with 0 Li_2CO_3, at 302° 1 2 cu m of gas mixt gave 0 5 g. of solid and 1 4 g of yellow oil insol in H_2O, and H_2O-sol acids equiv to 0 33 g. KOH Steam distn. from the K salts of the acids gave 0 5 cc liquid, b 74-80°, which gave the CHI_3 reaction in the cold Fischer's theory of intermediate carbide formation does not explain the formation of oxygenated compds The production of oxygenated compds and hydrocarbons may be regarded as preceded by the hypothetical formation of MeOH which gives CH_4 and other substances according to the conditions. The reaction may proceed in stages, or the catalyst may accelerate one or more of the possible reactions of CO and H When a mixt of aldehydes, ketones, acids and hydrocarbons is obtained, both courses may be followed Most of the products are probably formed simultaneously rather than consecutively. MARGARET W. MCPHERSON

The production of formaldehyde by the reduction of carbonic acid by hydrogen peroxide. E. RUPP AND H SCHLEE. *Biochem. Z.* **172**, 373-8(1926) —In the presence of small quantities of an Fe salt $NaHCO_3$ reacts with H_2O_2 to form formic acid and HCHO. During the reaction there is a lively evolution of gas which is a mixt of O and CO_2 The presence of HCHO in the reaction mixt was demonstrated by von Fillinger's test, which is specific, and is not affected by either HCOOH or H_2O_2 The test is carried out in this manner: to the mixt, first neutralized with dil. H_2SO_4, is added 5 cc of the special reagent (0 3% Witte peptone soln contg. 10 drops of 5% $FeCl_3$ in 100 cc). The tube is then underlayered with 5 cc concd H_2SO_4, when a ring develops, ranging in color from red to violet-blue, depending upon the amt. of HCHO present. This color was used in an attempt to study the reaction on a more or less quant basis It is suggested by these studies that the reactions proceed as follows·

$H_2CO_3 + H_2O_2 = HCOOH + O_2 + H_2O$, and the formic acid by Cannizzaro's reaction changes, thus: $2HCOOH = HCHO + H_2CO_3$. If this scheme of the reaction is correct, there should be a gradual increase in the OH-ion concn., which actually happens in the expts. as can be shown by the gradual reddening of added phenolphthalein. S. MORGULIS

Pyrogenic decomposition of hexadecene and of hexadecane under pressure. H. GAULT AND D. BARMANN. *Ann. off. nat. comb. liq.* **1**, 77-142(1926); *Chimie et industrie* **16**, 242(1926).—The investigation was carried out at temps. of 500–600° and pressures of 3–9 kg. per cm.[2] A review of the literature and descriptions of the app and methods of analysis are given. A no. of curves are given showing the proportions of hydrocarbons produced on thermolysis, and their phys and chem. consts. as functions of temp., pressure and nature of the walls of the app. The quantity of gas produced increases with pressure up to 3 kg., and then remains const. up to 9 kg, while the amt. of liquid decreases with temp. and pressure. The proportion of gases formed depends on the temp. and their compn. on the pressure, the ratio of $C_nH_{2n+2}:C_nH_{2n}$ increasing with increase in pressure. The probable mechanism of the formation of H is discussed in detail. The liquids formed contain satd, ethylene, acyclic and cyclic hydrocarbons. Pressure causes cyclization and hydrogenation and favors the production of satd and heavy (above C_{10}) hydrocarbons. A. PAPINEAU-COUTURE

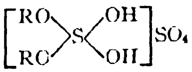
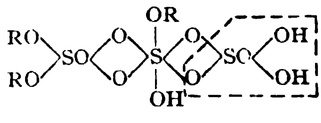
The preparation of methylacetylene. M. W. TAPLEY AND P. M. GIESEY. *J. Am Pharm Assoc.* **15**, 115-6(1926) —A method is described by which $MeC{:}CH$ may be produced by heating $MeCHBrCH_2Br$ with KOH in BuOH. The yield is 67% of gas practically 100% pure. L. E. WARREN

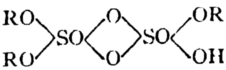
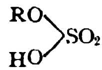
The preparation of tribromohydrin and propadiene. M. W. TAPLEY AND P. M GIESY. *J Am Pharm. Assoc.* **15**, 173-4(1926).—$CHBr(CH_2Br)_2$ was prepd. by a method which does not require a sealed tube A mixt. of 200 g. of $CH_3CHBrCH_2Br$ and 300 g of Br are heated with Fe (card teeth) in a reflux until HBr is no longer given off (1 2 hrs.). The resultant mixt is distd in a vacuum and redistd. at 760 mm. The 219-221° fraction is collected. Yield 78% of theory. The $CHBr(CH_2Br)_2$ was converted into dibromopropylene by the Gustavson-Demjanoff method. Propadiene was prepd. by dropping the dibromopropylene into a flask contg. Zn dust and EtOH and heating in a reflux. Yield 78% L. E WARREN

A study of the preparation of synthetic rubber hydrocarbon. WM. C. CALVERT *India Rubber Rev.* **26**, No. 9, 48–50, 52, 54(1926).—A survey of the literature, coupled with further expts. by C, make it almost certain that Me_2CO cannot be reduced to pinacol by ordinary reducing agents Reduction was attempted with $SnCl_2$ + dry HCl, SO_2, $NaNO_2$ + dil. HCl, Mg + dil. HCl, Zn + dil. HCl, Zn + concd. HCl, Zn + HOAc, Mg + concd. $(CO_2H)_2$, Al + NaOH and Al + concd. NaOH, but no pinacol was obtained in any case. It can, however, be prepd. by condensation of 2 or more mols. of Me_2CO with certain metals to form metallic alcoholates. The various published methods based on this type of reaction were studied, including the reactions with Na, Na-amalgam, Al-amalgam and Mg-amalgam. Special attention was paid to the Holleman method (cf Adams, *C. A.* **20**, 42), which was altered in various ways, such as the substitution of Zn for Mg and changes in the diluents and in the proportions of the reagents, in the attempt to increase the yield of pinacol. The highest yields (55 and 52%, resp) were obtained either by the same procedure recommended by Adams, except for mech agitation, or by doubling the amt of $HgCl_2$. The Holleman method was so sensitive to the conditions that reversing the order of mixing the reagents reduced the yield Replacement of $HgCl_2$ by $CuCl_2$, by $SbCl_3$ or by EtONa failed to yield any pinacol. S_2Cl_2 and Me_2CO under various conditions gave yellow products which were not identified. Other expts., such as the substitution of HOAc and of $(CO_2H)_2$ for H_2O to decomp the pinacolate, omission of the diluent and substitution of Hg for $HgCl_2$, failed to give promising results. Likewise electrolytic methods, using both Pt and Mg electrodes with Me_2CO and concd. aq. $MgCl_2$, and also a patented method using graphite electrodes with Me_2CO and dil. H_2SO_4, failed to bring about a reaction. Since the only successful methods for prepg. pinacol involve the use of Hg or $HgCl_2$ and since Mg coated with Hg has almost no action on Me_2CO, it is probable that an intermediate Hg pinacolate is formed. Mg liberates Hg in an active form, the latter condenses 2 mols. of Me_2CO to $(Me_2CO)_2Hg$, and this is decompd. by more Mg, forming $(Me_2CO)_2$-Mg and liberating Hg to react with more Me_2CO. $(Me_2CO)_2Hg$ could not be isolated Pinacol hydrate was treated with various dehydrating agents such as P_2O_5, H_2SO_4, $(CO_2H)_2$, CaO, $CaCl_2$, $KHSO_4$, etc., but the more active ones formed other products, such as pinacoline, and the less active had to be used in excessively large proportions The HBr method (cf. Kyriakides, *C. A.* **8**, 2353) for dehydrating pinacol to dimethyl-

butadiene gave the best results among several methods tested, a 58% yield being obtained. Though the yield was the same, the rate of the reaction was far slower with pure than with impure pinacol. Practically the same yield was obtained when HBr was replaced by $PhNH_3Br$ Attempts to prep. dimethylbutadiene directly by the dry distn. of Mg pinacolate gave a mixt of C_6H_6, mesityl oxide and unidentified compds, at least some of which were unsatd., but no dimethylbutadiene. C. C. DAVIS

Action of organic compounds on sodium hydrogen sulfate. H. B. DUNNICLIFF AND SUCHDEV SINGH *Quart J. Indian Chem Soc* **3,** 91 100(1926).—Acid sulfates are divided into 3 classes, (*a*) those from which all the H_2SO_4 is extd. by Et_2O-EtOH or Et_2O (Li, Ag, Ba, Sr), (*b*) those from which $^2/_3$ of the acid is extd. by EtOH but none by Et_2O (Na, NH_4); (*c*) those unattacked by Et_2O or EtOH (K, Rb, Cs). To these are assigned the formulas,

(*a*)  (*b*) 

(*b'*)  (*c*) 

the dotted area in (*b*) being the part extractable with EtOH, leaving the residue a "sesqui" salt (*b'*) Similarly, (*a*) and (*b*) are ordinarily deliquescent, while (*b'*) and (*c*) are not. From $NaHSO_4$ the same residue, $Na_3H(SO_4)_2$ (18 7% acidity), resulted with MeOH, EtOH, $EtCH_2OH$, Me_2CHOH, $EtCH_2CH_2OH$, Me_2CHCH_2OH, $Me_2CHCH_2CH_2OH$, $PhCH_2OH$, Me_2CO, MeCOEt, while $EtOOCCH_2Ac$, borneol, PhOH, $C_6H_4(OH)_2$ (*m* and *p*), AcPh, BzPh, quinone (the solids dissolved in Et_2O) have little or no effect Thus primary alcs and Me ketones are most effective The admixt of Et_2O diminishes the acid-extg. effect, possibly because of decrease in ionization of alcs and of enolization of ketones. A. W. FRANCIS

The kinetics of transformation of halogen alkylamines into heterocyclic compounds IV. H. FREUNDLICH AND H. KROEPELIN *Z physik Chem.* **122,** 39–48(1926).—The kinetics of the transformation of $BrCH_2CH_2NH_2$ into $\underbrace{CH_2\ CH_2\ NH_2}Br$ has been measured There does not seem to be an equil established or at least the rate is not that of a 1st-order reaction. The secondary reaction of imine formation strongly disturbs the equil, giving a very irregular behavior In H_2O-MeOH mixts. the const for 1st-order reactions decreases with decrease in MeOH concn Rates for alkylamines from ethane to hexane have been studied The propane deriv. reacts most slowly and butane most quickly. RAYMOND H LAMBERT

Optical resolution of chlorobromoacetic acid. H. J. BACKER AND W H. MOOI *Verslag Akad. Wetenschappen Amsterdam* **35,** 737 8(1926), cf *C A.* **19,** 2637, 2927 Pope and Read have not succeeded in resolving $ClBrCHSO_3H$ (**I**) into its optical isomer while $ClCHSO_3H$ presented no such difficulty, $FClBrCCO_2H$ also shows a remarkable tendency to racemization. The hypothesis that the chem. resemblance of Cl and Br is responsible for this tendency led to the study of **I**. The acid prepd. from trichloroethylene was split by "cold crystn" of the brucine salt (*l*-) or preferably the quinine salt (*d*-). The max. $[\alpha]_D$ of **I** is $+8°$; of the *NH_4 salt* (**II**) $-8°$. The tendency to racemization was not pronounced An aq soln of **II** was not racemized on 24 hrs' standing even in presence of 1 mol. NaOH. The rotation was reduced to 50% by heating the alk. soln. 1 hr. on the water bath or by keeping a 0.089 mol. soln 8 months at room temp. MARY JACOBSEN

Organic lead compounds. Z. ZELLER *Continental Met. Chem. Eng.* **1,** 17 (1926).—A brief review The stability of the aliphatic Pb compds. decreases with rising mol. wt. of the org radicals. Of compds contg. isomeric radicals, those contg normal radicals are the more stable. Bivalent and tervalent compds. are less stable than the quadrivalent compds. of Pb The influence of acids and of alkalies and the uses of these compds. of Pb are mentioned. W. H. BOYNTON

Natural methylheptenone. Alcohols, dienes and cyclogeraniolene derivatives. RENÉ ESCOURROU. *Bull. soc. chim.* **39,** 1121–38(1926).—Methylheptenone (I) obtained by boiling citral with 10% K_2CO_3 for 12 hrs. By treating I with various Grignard reagents the following carbinols were prepd.: *Methylmethylheptenol,* b_{13} 77-

b_{740} 173–5°; *acetate*, b_{740} 184–6°, d_{11} 0.883, n_D^{11} 1.44235. *I*
b_{736} 197°, n_D^{15} 1.45658, d_{17} 0.8572; *acetate*, b_{738} 214°, d_{12} (
methylheptenol, b_{18} 102–3°, d_{11} 0.8592, n_D^{11} 1.45727; *acetat*
1.45247. *Isopropylmethylheptenol*, b_{12} 97–8°, d_{10} 0.8717,
heptenol, b_{12} 119°, $d_{10.5}$ 0.8603, n_D^{10} 1.45997; *acetate*, b_{13} 122
Isoamylmethylheptenol, b_{14} 123–4°, d_{11} 0.8566, $n_D^{10.6}$ 1.4
b_{19} 155–6°, d_{10} 0.9679, n_D^{13} 1.52316 *Benzylmethylheptenol*
$d_{1.05}$ 0.9654, n_D^{10} 1.52632. II when distd. at ordinary press
peculiar type of decompn. seems to be general for this serie
by a trace of H_2SO_4 or of alkali.

Triethylene trisulfide and 1, 4-dithian. Prafulla C
Chandra Bose-Rây. *Quart. J. Indian Chem. Soc.* **3**, 73–
16, 3065.—Polemic against Bennett and Berry (*C. A.* **19**, 2
their triethylene trisulfide showed by f. p. detn. in C_6H_6
$(C_2H_4)_2S_2$ but claim that the compn. of its Pt salts, (C_2H_4)
proves the termol formula.

Lengthened chain compounds of sulfur. P. C. Rây an
J. Indian Chem. Soc. **3**, 75–80(1926); cf. preceding abstr.—
be prepd from $C_2H_4(SH)_2$ and $C_2H_4Br_2$ in presence of NaC
gradually with cooling in dil. EtOH soln. In more concd.
and without cooling, "polymers" (cf. Meyer, *Ber.* **19**, 3263(1
$C_2H_4Br_2 + nC_2H_4(SNa)_2 \longrightarrow BrC_2H_4(SC_2H_4)_{2n}Br + 2nNaB$
which n = 10, 12, 16, 24, 26, 32, 40, 48, were isolated
with mol wts as high as 3068. When heated several hrs.
comp. progressively, giving off $(C_2H_4)_2S_2$.

The transformation of ammonium thiocyanate into ca
and the decomposition of mellon to carbon dioxide and
Keller and W. Klempt *Z. angew. Chem.* **39**, 1071–3(1926)
The best CS_2 yields (80% of the theory) are obtained when a
is allowed to drop into an Al vessel with Ni lining, heated to 3
yielding a residue with 25% Al. The volatilizing NH_4CNS
NH_3 is absorbed in 10% H_2SO_4 heated to 90–100°, yielding
are condensed in an efficient water-cooled system. Twenty
as H_2S. Mellon, $C_6H_3N_9$, yield 21.9% of the NH_4CNS. is
compd. to CO_2 and NH_3 when heated to 500° with steam in
compn suggests its use as a *fertilizer*.

The preparation of diethyl acetal. G. Fouque and M. (
39, 1184–6(1926).—EtOH and metaldehyde in the prese
ether (b 200–300) and a trace of HCl react to form diethyl
supernatant layer of petroleum ether takes up the acetal as it
it effectually from the field of the reaction (the alc. layer) an
equil. and giving rise to the high yield.

Effect of structure of organic halides on their rate of reacti
I. The effect of the hydroxyl, phenoxyl and benzoxyl gr
J. Am. Chem. Soc. **48**, 2745–53(1926).—The following reacti
reported: $HOCH_2CH_2Cl$, 50°, 0.070; 60°, 0.201; $HO(CH_2)_3Cl$
$PhOCH_2CH_2Cl$, 450°, 0.0124; 60°, 0.034; $PhO(CH_2)_3Cl$, 50°,
$(CH_2)_4Cl$, 50°, 0.0572; 60°, 0.157. $BzOCH_2Cl$, 25°, 0.17; 35
50°, 0.0186; 60°, 0.0484; *γ-chloropropyl benzoate*, b_2 133–4°, 2
Listing the groups which have been studied in the order of
yields the following series: Bz, EtO_2C, AcO, HO, Ph, BzO, I
ment may vary somewhat when comparing compds. contg. sev
the 2 functional groups. This appears to be due to the fact t
greater alteration in reactivity than a 2nd group, when the fu
together but it is not capable of impressing its effect through
chain as the 2nd group.

Etherates of the magnesium halides. Jakob Meisenhe
Hans Lange. *Z. anorg. allgem. Chem.* **147**, 331–44(1925).—In
phous dihalides $MgX_2 \cdot 2Et_2O$ (cf. *C. A.* **15**, 3978) the authors p
chloroiodide and bromoiodide. The formulas approximated
methods served; for example, the chloroiodide was prepd. (1)
Mg chloride with alkyl iodide and (2) by the action of alkyl Mg i

In high vacuum the attached ether is almost completely lost, the rate depending upon the temp., the pressure and the character of the compd. R. A. BAKER

Ethers of 1,3-dihaloisopropyl alcohol and of 3-halo-1,2-propanediol. L. BLANCHARD. *Bull. soc. chim.* 39, 1119-21(1926).—$ClCH_2CH(OCH_2Cl)CH_2Cl$ (I), b_{17} 95-6°, is prepd. by passing dry HCl into a suspension of trioxymethylene in $ClCH_2CH(OH)CH_2Cl$. $(ClCH_2)_2CHOCH_2OCH(CH_2Cl)_2$, m. 51°, is formed simultaneously. Similarly, $ClCH_2OCH_2CH(OCH_2Cl)CH_2Cl$ results from $ClCH_2CH(OH)CH_2OH$. With MeMgX I gives $ClCH_2CH(OEt)CH_2Cl$, b_{18} 63-5°; $ClCH_2CH(OEt)CH_2I$ is obtained similarly. REYNOLD C. FUSON

New method for the preparation of alkali glyceroxides. C. F. CROSS AND J. M. JACOBS. *J. Soc. Chem. Ind* 45, 320-1T(1926).—Equimol. amts of powd. NaOH and anhyd. $C_3H_5(OH)_3$, heated with const. stirring up to 115°, give quant the Na glyceroxide, hygroscopic, decomps. 235°, sol. in hot EtOH and AcOEt. The K compd. is prepd. similarly; other glycols react with NaOH under these conditions. Various ethers may be prepd. from the Na compd and bromides; Et ether, b_{760} 231-2°, 86 5-88° (*in vacuo*), d_{20} 1.063; iso-Am ether, in 50% yield, b_{27} 137-9°, b_{758} 251-2°, d_{20} 0.977; *benzyl ether*, in 75% yield, b_2 124-6°, d^{15}_{16} 1.196, of aromatic odor and burning taste. In the above reaction no di-Na salt is formed C. J. WEST

The configurational relationships of 2-hydroxy, 3-hydroxy and 4-hydroxy acids. II. Conversion of dextro-1-amino-3-hydroxybutane into dextro-1,3-dihydroxybutane. P. A. LEVENE AND H. L. HALLER. *J. Biol. Chem.* 69, 569-74(1926); cf. *C. A.* 20, 2980.—Dextro-1-amino-3-hydroxybutane was obtained from 4-hydroxyvaleric acid by a modification of the Curtius method $Ba(OH)_2$ was substituted for HCl in the hydrolysis of the sym. dihydroxybutylurea since the resulting hydroxyamine was racemized when HCl was used. From the deamination product of the base a product having a b. p approaching that of 1,3-dihydroxybutane was obtained This rotated polarized light in the same direction as the parent amine. From it a di[phenylurethan] was obtained whose rotation was in the same direction as that of the di[phenylurethan] obtained from the product of reduction of the dextro-3-hydroxybutyric acid. It is concluded that dextro-3-hydroxybutyric and dextro-4-hydroxyvaleric acids are configurationally related and both are related to dextro-lactic acid All 3 belong to the *l*-series. Free dextro-4-hydroxyvaleric acid behaves as lactic and 3-hydroxybutyric acids of the *l*-series. ARTHUR GROLLMAN

Valence of nitrogen in quaternary ammonium compounds. F. D. HAGER AND C. S. MARVEL. *J. Am. Chem. Soc.* 48, 2689-98(1926)—A modified and more satisfactory technic is reported for the prepn. of Li alkyls LiEt and Et_3BuNBr at 70° give Et_2NBu; at —70° there also results some Et_3N. iso-AmLi gives the same mixt. LiBu and Et_4NBr give Et_3N; with $Et_3(PhCH_2)NBr$ there results Et_2NCH_2Ph; with $Bu_3(C_7H_{15})NI$, $Bu_2NC_7H_{15}$; LiC_7H_{15} and Bu_4NI give Bu_3N. *Diheptylmercury*, in 90% yield from $C_7H_{15}MgBr$ and $HgCl_2$, b. 119 22°, n^{21}_D 1.4935, d^0_0 1.474. *Triethylbutylammonium bromide*, m 212-5° (decompn.); the *iodide*, m 205° (decompn.); *triethylbenzylammonium bromide*, m. 195° (decompn); the *iodide*, m. 128-35°; *tetrabutylammonium iodide*, m. 144-5°; the chloride or bromide did not cryst ; *tributylheptylammonium iodide*. *Diethylbutylamine*, b. 136-7°, d^0_0 0.7614. *Dibutylheptylamine*, b_7 119-20°, n^{15}_D 1.4389, d^0_0 0.8088. If pentaalkyl N compds. are formed in the above reactions, they are very unstable and at once yield tert. amines and hydrocarbons These results indicate that the 5th valence of N in NH_4 compds. retains its unique character even under conditions most favorable for its being otherwise and at no time does it become equiv. to or is there any exchange of groups between it and any of the other 4 valences. C. J WEST

Basis for the physiological activity of -onium compounds. VII. Derivatives of betaines. R. R. RENSHAW AND H. T. HOTCHKISS, JR. *J. Am. Chem. Soc.* 48, 2698-702(1926); cf. *C. A.* 20, 2976.—*Methylbetaine* (*carbomethoxymethyltrimethylammonium bromide*), from Me_3N in PhMe at —10° and $BrCH_2CO_2Me$, m. 182.5° (all m. ps. are cor.). *Ethylbetaine*, m. 158.4°; *Bu deriv.*, m. 100.4°; *benzyl deriv.*, m. 111.5°. *Methyl(carbethoxy)methyltrimethylammonium bromide*, $MeCH(CO_2Et)NMe_3Br$, from Me_3N in PhMe at —10° and $MeCHBrCO_2Et$, m. 146.5°; *Pr deriv.*, m. 179.6°; *Bu deriv.*, m. 144.5°; *Ph deriv.*, m. 197.5-8°. *Betaine amide* (*carbamylmethyltrimethylammonium chloride*), from Me_3N and $ClCH_2CONH_2$ at 70°, m. 194 5° All the derivs of betaine studied in which the acid H atom has been replaced are, unlike betaine itself, physiol. active. It is suggested that the physiol. inactivity of betaine is due to its existence in the blood stream as the elec. neutral and hence physiol. inert bipolar ion, $^+[Me_3NCH_2CO_2]^-$. The esters of betaine and their derivs., as well as its amide, form elec. active cations and all of them are physiol. active. C. J. WEST

The preparation and study of β-d-glucuronic acid monobenzoate (benzoylglu acid). A. J. Quick. *J. Biol. Chem.* **69,** 549–63(1926).—Directions are given isolation of benzoylglucuronic acid from dog urine after feeding BzOH. It is anhyd. cryst. solid, readily recrystd. from hot H_2O without decompn., it m. (decompn.), soly. in H_2O is about 3 parts per 100, readily sol. in MeOH, less in and sparingly sol. in AcOEt and Et_2O, resembles glucuronic acids in being st cold dil. mineral acids and in being a fairly strong acid, dissocn. const. is 1.4 × readily hydrolyzed by weak alkalies, reduces Fehling soln. directly, $[\alpha]^{20}_D$ – In alk. soln. it shows mutarotation, the rate of change being a function of the in a strong alk. soln. a max. d-rotation is obtained which soon decreases, becomes const., and finally falls and approaches zero. It reacts with HCN with a loss of r power. The compd is, therefore, considered as having a free aldehyde group w BzOH attached in ester linkage to one of the OH groups of glucuronic acid. Its chem name is therefore, β-d-glucuronic acid α-monobenzoate. Ingested by it is slowly eliminated as hippuric acid. The acid lactone and Me ester als prepd The former was obtained from the mother liquor as a yellowish granular m with 1 mol of H_2O of crystn., m. 98–102° (decompn. on further heating), $[\alpha]$ The Me ester was prepd as a pure white solid, soly. in H_2O 1 part in 500, m. 17 (partial decompn.), $[\alpha]^{20}_D$ —25.0° (0.2% soln.). It is mutarotated by adding a conc. NH_3. It forms a Me glucoside on standing with MeOH satd. with

Arthur Groll

Preparation of mono-esters of saturated aliphatic bi-acids by azeotropic m C. Contzen-Crowet. *Bull. soc. chim. Belg.* **35,** 165–98(1926).—The method c of using an excess of alc. (over the monomol. mixt.) calcd. to remove as the aze mixt. all of the H_2O formed in the reaction. On heating until all H_2O is remove yields are obtained. The various following esters have been prepd., commen special notes being given on the individual prepns. A no. of these compds. ha been previously described. *Oxalic acid esters: mono-Et,* 70% yield, b_4 88°, b_1 d_{20} 1.2427, n^{20}_D 1.4236; *mono-Pr,* 62% yield, b_{13} 118°, d_{20} 1.1661, n^{20}_D 1.4257; th *mono-Bu* and *mono-Am* compds. could not be prepd.; *di-Et,* b_{760} 185.9°, d_{20} 1 n^{20}_D 1.4100, abs. viscosity (20°) 2.01 × 10^{-5}; *di-Pr,* b_{760} 213.9°, b_{18} 104°, m. — d_{20} 1.0172, n^{20}_D 1.4163; *di-Bu,* b_{760} 245 5°, m. —29.5°, d_{20} 0.9855, n^{20}_D 1.4232. *St acid esters: mono-Et,* m. 8°, b_3 119°, d_{20} 1.1468, n^{20}_D 1.4327, abs. viscosity (20°) 28. 10^{-5}; *mono-Pr,* yield 73%, m. 15°, b_3 126°, d_{20} 1.1071, n^{20}_D 1.4343; *mono-Bu,* yield, m. 8.5°, b_3 136.5°, d_{20} 1.0732, n^{20}_D 1.4360; *mono-Am,* yield 81%, m. 17.2°, b_3 d_{20} 1.0460, n^{20}_D 1.4378; *di-Et,* b_{760} 217.3°, m. —20.5°, d_{20} 1.0406, n^{20}_D 1.4201, abs. vis (20°) 2.77 × 10^{-5}; *di-Pr,* b_{760} 248°, m. —10.4°, d_{20} 1.0011, n^{20}_D 1.4252; *di-Bu,* b_{760} 2 b_4 108°, d_{20} 0.9760, n^{20}_D 1.4298; *di-Am,* b_{16} 171.5°, b_3 146°, m. —9°, d_{20} 0.9613, n^{20}_D 1 *Adipic acid esters: mono-Et,* 59% yield, b_{10} 163°, m. 29.2°, n^{20}_D 1.4388; *mono-Pr* yield, b_4 146°, d_{20} 1.0574, n^{20}_D 1 4401; *mono-Bu,* 78% yield, b_4 155.5°, d_{20} 1.037 1.4418; *di-Pr,* b_{16} 155°, m. —20°, d_{20} 0.9790, n^{20}_D 1.4314; *di-Bu,* b_4 145°, m. — d_{20} 0.9652, n^{20}_D 1.4369. *Malonic acid esters: mono-Et,* 59% yield, b_3 106.5°, b_{12} 1. m. —13.2°, relative viscosity 15.66, d_{20} 1.1886, n^{20}_D 1.4283; *mono-Pr,* b_3 118.5°, d_{20} 1 n^{20}_D 1.4301, abs. viscosity (20°) 16.23 × 10^{-5}; *mono-Bu,* 68% yield, b_3 132°, d_{20} 1. n^{20}_D 1.4328; *mono-Am,* 62% yield of crude product but could not be purified; b_{760} 198.4°, b_{18} 98°, d_{20} 1.0554, n^{20}_D 1.4142, abs. viscosity (20°) 2.12 × 10^{-5}; *di-P* 229.2°, d_{20} 1.0088, n^{20}_D 1.4206, abs. viscosity (20°) 2 80 × 10^{-5}; *di-Bu,* b_{18} 140°, d_{20} 0 n^{20}_D 1.4262. In general the stability increases with the mol. wt. of the acid in a with const. alc. constituent. Other data than those tabulated above are given, $n_{H\alpha}$, etc.

W. B. Plum

Condensation of malonic esters with acetoacetic esters. I, II. H. Gault L. Klees. *Bull. soc. chim.* **39,** 883–905, 1000–19(1926).—Condensation of AcC CO_2Et and $CHNa(CO_2Et)_2$ gave *tetra-Et ethanetetracarboxylate,* m. 76°, and suc succinic ester. $AcCHClCO_2Et$ and $CHNa(CO_2Et)_2$ condensed in alc. gave A $ClCH_2CO_2Et$, *tri-Et ethanetricarboxylate, tetra-Et propanetetracarboxylate,* b_{15} 194– and *penta-Et propanepentacarboxylate,* b_{15} 223°. In order to avoid alcoholysis the compds were condensed in toluene and found to give normal condensation proc $CH_2(CO_2Et)_2$, $AcCHClCO_2Et$, $[CH(CO_2Et)_2]_2$ and *tetra-Et ethylidenehydroxye*

rboxylate. Sapon of the latter acid gave levulinic acid, which was identified by iicarbazone. Considerable discussion is given to attempt an explanation of these ns. The condensation of $CHBr(CO_2Et)_2$ with $AcCHNaCO_2Et$ (I) gave [CH-t)$_2$]$_2$, $CH_2(CO_2Et)_2$ and *tetra-Et diacetylpropanetetracarboxylate.* Bromomethyl-c and bromoethylmalonic ester were condensed with I. Br was easily re- in each case, forming either malonic ester or alkylmalonic ester or [CH-)$_2$]$_2$ and a product of high mol. wt. b_{16} 200–40° $CHCl(CO_2Et)_2$ and I gave tonic isomer of *tri-Et acetylethanetricarboxylate,* m. 34°, which was identified by *iicarbazone,* m 106°, and *phenylhydrazone,* m. 89°. The condensation of CHCl-t)$_2$ and I in toluene gave the same results as in alc., giving $[CH(CO_2Et)_2]_2$. The cts from the condensation of chloromethylmalonic ester and I could not be identi- Methods are given for transforming the two tautomeric forms of acetylethane-ionic ester into each other. R. C. Roberts

[etallic compounds of rubeanic acid. Priyadaranjan Rây and R. M. Rây. *J. Indian Chem Soc.* 3, 118–26(1926).—Rubeanic acid was prepd. by passing a current of dry and pure C_2N_2 into a freshly prepd. ice-cold soln. of KHS in abs. d acidifying the satd. soln with dil. HCl. Cu, Ni and Co rubeanate were prepd. ling alc. solns. of the acid to salt solns. of the corresponding metals. Their general la is given as $MeC_2H_2N_2S_2$. Methods for estg. the Ni and Co in these compds. ven. Rubeanic acid and $AgNO_3$ gave a black ppt which passed at once into Ag_2S. Hg' salts it gave a white ppt. quant. Hg'' salts behaved similarly. The ppt. a indefinite mixt of the acid and HgCl. Cd salts gave a yellowish white ppt. changed to CdS on boiling. Zn gave a white ppt Au and Pt gave brownish ppts. Carbonato-tetrammino-cobaltic nitrate and rubeanic acid in NH_3 soln *tra-aquo-di-ammino-trirubeanato-dicobalt,* $[Co_2(H_2O)_4(NH_3)_2(C_2H_2S_2N_2)_3]$ It loses when heated to 115–20° and gives $Co(C_2N_2S_2H_2)_3(NH_3)_2$ The use of rubeanic n the estn. of Cu, Co and Ni in soln. is suggested. R. C Roberts

thylenediguanidine. Martin Schenck. *Z. physiol. Chem.* 155, 306–13(1926); *A.* 20, 3284.—At room temp. $(CH_2NH_2)_2.H_2O$ reacts with 2 mols of MeSC-)NH_2.HI in EtOH to form 73% of *ethylenediguanidine-2HI,* m 218–20° with ion of MeSH; *dinitrate,* m. 252°; *dichloroaurate,* decomps 258°; *chloroplatinate,* ps. 255–8°; *dipicrate,* decomps. 284–5°; *dipicrolonate,* decomps. 284° A. W. D.

Guanido-α-aminocaproic acid and ϵ-amino-α-guanidocaproic acid. Hellmut *Z. physiol. Chem.* 155, 292–305(1926).—The first of these isomers was prepd. method used for the prepn. of α-methylarginine (cf. following abstr). *ϵ-Benzoyl-nesulfolysine,* m. 197°, was obtained from benzoyllysine and p-$MeC_6H_4SO_2Cl$, he Bz removed by hydrolysis with KOH to give 84 9% of *α-toluenesulfolysine,* not stated. Treatment of the latter in NaOH with EtSC(:NH)NH_2.HBr con-it into *ϵ-guanido-α-toluenesulfonaminocaproic acid,* m 119°, decomps. 237° 75 2%). Crystd. from H_2O, it contains $2H_2O$ Finally the removal of Me-O_2 as MeC_6H_4SH by heating in a sealed tube at 85° for 35 min with HI and PH_4I, and treatment with Ag_2O gave a soln. the N content of which represented an yield of *ϵ-guanido-α-aminocaproic acid,* and from it the following salts were prepd.: *copper nitrate* *+0.5 H_2O,* decomps. when anhyd 230–1°; *mononitrate +1H_2O,* °, m. anhyd. 115–20°. The guanido acid is pptd. from acid soln by phospho-ic acid and from $Ba(OH)_2$ soln. by $AgNO_3$ as a Ag salt. It is not hydrolyzed by se from fresh calf liver The 2nd isomer was obtained as the glycocyamidine. *oylamino-α-guanidocaproic acid,* m. 216°, was prepd. from ϵ-benzoyllysine by :NH)NH_2.HBr and also by $CNNH_2$. Crystd. from H_2O it contains $3H_2O$ val of Bz by hydrolysis with HCl results in ring closure to form *5-δ-aminobutyl-yamidine,* which was obtained in 76% yield as the *di-HCl salt; picrolonate,* decomps. It does not form a double salt with $Cu(NO_3)_2$ or $ZnCl_2$. The Ag salt is pptd. atment of the HNO_3 salt with $AgNO_3$ and $Ba(OH)_2$. The free base could not be d by treatment with Ag_2O because of formation of a Ag salt. A. W Dox

-α-Methylarginine. Hellmut Steib. *Z. physiol. Chem.* 155, 279–91(1926).—*oyl-α-toluenesulfoornithine,* m. 180°, was prepd. in 80% yield by shaking an alk. of δ-benzoylornithine with p-$MeC_6H_4SO_2Cl$ in Et_2O for 10 hrs., acidifying the aq. and allowing the sepd. oil to crystallize. By methylation of this with Me_2SO_4 *N* NaOH and acidifying with AcOH a 93% yield of *α-toluenesulfo-α-methyl-δ-lornithine,* m 185°, was obtained. From this the Bz was split out by refluxing HCl and EtOH to form *α-toluenesulfo-α-methylornithine-HCl,* m. 224°, in 80% but more satisfactorily by aq. $Ba(OH)_2$ to form the *free base,* m. 219°. Conver-ito the corresponding guanidine deriv. was effected by treatment with $CNNH_2$ ter by EtSC(:NH)NH_2 HBr and NaOH, giving *α-toluenesulfo-α-methylarginine,*

decomps. 268° (yield 66.7%). Finally the $MeC_6H_4SO_2$ was removed by heating in a sealed tube with concd. HI and PH_4I, filtering from the sepd. MeC_6H_4SH and excess PH_4I, evapg. *in vacuo* and treating with Ag_2O. The N content of the resulting soln. indicated a yield of 83.7% of *α-methylarginine*, from which the following salts were prepd: *flavianate*, decomps. 245–6°; *copper nitrate* $+2H_2O$, decomps. when anhyd. 228–9°; *mononitrate*, m. 192°. Methylarginine is pptd. from acid soln. by phosphotungstic acid, and from $Ba(OH)_2$ soln. as the Ag salt by $AgNO_3$. In contrast to arginine it is not hydrolyzed by arginase from calf liver. A. W. Dox

The decomposition of creatinine with baryta. O. H. Gaebler. *J. Biol. Chem.* **69**, 613–24(1926).—The course of decompn. of creatinine by $Ba(OH)_2$ was studied. The sarcosine and urea formed in this decompn. combine in part to give methylhydantoic acid. Methods for the prepn. of methylhydantoin and methylhydantoic acid from creatinine and the isolation of sarcosine are given. The color reactions of hydantoin, methylhydantoin and creatinine with alk. picrate are described. Methylhydantoic acid is dehydrated more easily and hydantoic acid with greater difficulty, than creatine. The m. p. of methylhydantoin was found to vary from 132° to 140° but it m 142° (effervescence) when rapidly heated in a sealed capillary tube. A. G.

Some acetophenone derivatives of barbituric acid. De W. T. Keach and A. J. Hill. *J. Am. Chem. Soc.* **48**, 2743–5(1926).—The appropriate alkylbarbituric acid and $BzCH_2Br$ were heated in EtOH; the following derivs. of *acetophenonylbarbituric acid* were thus obtained (m. p. and yield given): *5-Et*, 248–9°, 50%; *5-Pr*, 299–300°, 33; *5-allyl*, 270–1°, 75; *5-iso-Bu*, 286–7°, 50; *5-Bu*, 294–5°, 53. These derivs are quite toxic and, excepting the Et deriv., lack hypnotic properties. The Et deriv is fairly hypnotic in its action but possesses undesirable toxicity. C. J. West

Alloxanic acid. Heinrich Biltz and Fritz Lachmann. *J. prakt. Chem.* **113**, 309–32(1926).—A mixt of Ba alloxanate and abs. EtOH, satd with HCl, gives 70–80% of Et alloxanate (I), m. 115°; the Me ester (II), m. 171°, results in about the same yield. More energetic treatment with EtOH and HCl gives *Et 5-ethoxyhydantoin-5-carboxylate* (III), m. 84–6°; the corresponding Me deriv, m. 136°. I in concd NH_4OH gives nearly quant. the amide, m. 191°. I (15 g.) in 20 cc. well cooled 15% aq. $MeNH_2$ gives 7 g. *5-hydroxyhydantoylmethylamide*, crystg. from EtOH with 1 mol. solvent, decompg 145–6° and from H_2O with 1 mol. H_2O, decompg 162–3°. The *ethylamide* decomps. 136°; the *phenylamide*, m 99°, clears 105° and decomps. 150°. II and CH_2N_2 give Me 1,3-dimethyl-5-methoxyhydantoin-5-carboxylate, m. 72°. Alloxanic acid and CH_2N_2 give 5-methoxy-1,3-dimethylhydantoin. III and 10% $MeNH_2$ give 90% of *5-ethoxyhydantoylmethylamide*, m. 111°; the *ethylamide*, m. 136–7°. Heating III in H_2O for 2 min. gives *5-ethoxyhydantoincarboxylic acid*, crystg. with $2H_2O$, m. 54°; the crystal form is described Over $CaCl_2$ this gives a *monohydrate*, m. 90–1°. *5-Methoxyhydantoylphenylamide*, m. 134° (94% yield) *1-Methyl-4-methylimino-5-ethoxyhydantoylmethylamide*, from the Et ester and 15% $MeNH_2$ in 80–90% yield, m. 257–8°; *Ac deriv.*, m. 168° The corresponding *ethylamide*, m. 224–5°; *Ac deriv.*, m. 163–4°. *Et 1-methyl-5-ethoxyhydantoincarboxylate*, m. 82–3°, in 95% yield by satg. Et 1-methyl-5-ethoxyhydantoylcarbamate in EtOH with HCl. The amide m. 206–7° and with Ac_2O gives the *3-Ac deriv.*, m. 136–7°. The *3-Ac deriv.* of 1-methyl-5-ethoxyhydantoylmethylamide m. 111–2°. *1-Methyl-5-ethoxyhydantoylethylamide* crysts. with H_2O and m. 131–2°; the anhyd. *amide*, m. 101–2°. C. J. West

Salts of alloxanic acid; a systematic investigation of hydrates. Heinrich Biltz and Fritz Lachmann. *J. prakt. Chem.* **113**, 333–47(1926).—Ba alloxanate, crystd. from H_2O at 35°, ceps with 5 mols. H_2O, but 1 of the H_2O is very loosely held. EtOH ...s the H_2O content very slowly. At 80° in vacuum all but 0.5 mol. H_2O is split ...out 10 hrs and the salt is completely dehydrated in 60 hrs. Over P_2O_5 there ...he hemihydrate; the reaction is complete in about 80 days. Over $CaCl_2$ there ... the tetrahydrate, the reaction requiring about 1100 hrs. The Sr salt likewise ... pentahydrate; over P_2O_5 *in vacuo* this loses 3 mols. H_2O very easily and then ...ly (200 days) forms the monohydrate; there are indications of a hydrate with ... H_2O. The Ca salt crysts. with $5H_2O$; at 100° or over P_2O_5 at room temp. ...dually forms the hemihydrate. The acid Ca salt crysts. with $6H_2O$, gradually ...ed by P_2O_5 at room temp. to the monohydrate. The K salt crysts. with ...d loses 2.5 mols. at 100° after 36 hrs.; in vacuum at 80° or over P_2O_5, the anhyd. ...ts in about 4 days. The acid K salt crysts. without H_2O of crystn. C. J. West

...effect of disodium phosphate on *d*-glucose and *d*-fructose. H. A. Spoehr ... C. Wilbur. *J. Biol. Chem.* **69**, 421–34(1926).—In the presence of Na_2HPO_4, ...gars are converted into ketoses and *vice versa*. With neutral phosphate mixts.

the reaction is slower. Na_2HPO_4 converts *d*-glucose and *d*-fructose into a non-fermentable substance having properties corresponding to the *d*-glutose of Bruyn and van Ekenstein. No acids are formed in this reaction, and there is a decided decrease in the total reducing power of the soln. In the presence of Na_2HPO_4, solns of *d*-glucose and *d*-fructose become colored with tar. This may be prevented by the addn. of an oxidizing or reducing agent. The bearing of these findings on the structure of *d*-glutose is discussed. ARTHUR GROLLMAN

Action of aniline on glucose in acetic acid solution. II. C. N. CAMERON. *J. Am. Chem. Soc.* **48,** 2737-43(1926); cf. *C. A* **20,** 2988.—The color produced in solns. of glucose, $PhNH_2$ and AcOH is not due to any peculiar property of the amine, as *o*- and *p*-$MeC_6H_4NH_2$ behave in a similar manner, nor is it due to AcOH as such, for KH_2PO_4 can be used as the acid component. As solns. of glucose, $PhNH_2$ and AcOH show a reactive condition and as glucose has little effect on the color of PhNHMe solns, it is held that the glucose anilide is changed to a more reactive form, probably the aldehyde isomer. The color may, in part, be due to oxidation of the $PhNH_2$ in the presence of glucose but only in part, as $PhCH_2NH_2$, which is difficult to oxidize, in the presence of glucose and AcOH rapidly becomes colored. C. J. WEST

Mechanism of carbohydrate oxidation. IV. The action of potassium hydroxide on *d*-glucose and *d*-galactose. WM. LLOYD EVANS, RACHEL HARTMAN EDGAR AND GEORGE PRESTON HOFF. *J. Am. Chem. Soc.* **48,** 2665-77(1926); cf. *C. A.* **20,** 369.—The action of various concns. of KOH at different temps. on aq solns. of *d*-glucose (I) and *d*-galactose (II) was studied for the purpose of ascertaining whether these 2 exptl. factors would produce a change in the equil. system of enediols that are formed in alk. solns. of the 2 carbohydrates. The lactic acid obtained from alk solns of I and II is formed by a cleavage of the 3,4-enediol into the methylenenol of $CH_2(OH)CH(OH)$-CHO, which in turn is converted to AcCHO, a compd that yields lactic acid. The amt. of lactic acid obtained from I and II is a function of both the alkali concn. and of the temp., and is therefore regarded as an index of the extent to which the carbohydrates are converted into the 3,4-enediol. The shifting of the equil in the enediol systems by means of alkali concn. and temp. is much greater in I than in II solns as is evidenced by the fact that lactic acid is obtained in much greater quantities from I than from II. AcOH and HCO_2H are probably formed from the decompn. of AcCHO into AcH and CO_2. The production of these 2 acids reaches a max with increasing concn. of alkali, after which there is a diminution in the yield The max point is thought to be due to the speed of conversion of AcCHO into lactic acid being just equal to that for the formation of AcOH and HCO_2H at that alky The diminishing yield of the acids is due to the increasing rate of lactic acid formation with increasing alk concn. The total yield of HCO_2H is greater than that obtained from AcCHO This is thought to be an index of the extent to which the carbohydrate is converted into the 1,2-hexose enediol, by reason of the cleavage of this enediol into HCHO methylenenol and a pentose The total yield of HCO_2H tends to approach that equiv. to the total AcOH yields from the 3,4-enediol as the alkali concn and the temp are increased. The yield of AcCHO osazone is a function of both the alkali concn and the temp. until a point of alky is reached at which the rate of its conversion into lactic acid is greater than the osazone formation. Until this point is reached, in the absence of $PhNHNH_2$, the aldehyde yields AcOH and HCO_2H. *d*-Galacto-α-metasaccharinic acid lactone is thought to be an index of the extent to which the carbohydrate exists as 2,3-enediol, at any given alky. The yields of this lactone are also found to be functions of the temp. and the alkali concn. A mechanism is offered for the formation of hexose *o*-diketo derivs which are supposed to be the intermediates in the production of the various saccharinic acid lactones (saccharins). This mechanism directly relates these lactones to the 3 hexose enediols which are regarded as the active components of these alk. solns. The data are shown in figures. **V. The oxidation of dihydroxyacetone to hydroxypyruvic aldehyde.** WM. L. EVANS AND CHARLES EDWARD WARING *Ibid* 2678 81.—$(HOCH_2)_2CO$ is oxidized by satd aq. $Cu(OAc)_2$ at room temp. to *hydroxypyruvic aldehyde* (I), which exists in the solid form as a trimer, m. 99°; in cold H_2O it depolymerizes very slowly but in hot solns. very rapidly. At 65° $Cu(OAc)_2$ gives mesoxalic acid; at 80° $CuSO_4$ gives I. **VI. The action of potassium hydroxide on *dl*-glyceraldehyde.** WM. L. EVANS AND HENRY BOHN HASS. *Ibid* 2703-14 —Methods are given for the prepn. of CH_2:CHCHO, $ClCH_2CH_2CHO$, CH_2:$CHCH(OEt)_2$, $HOCH_2CH(OH)CH(OEt)_2$ and $HOCH_2CH(OH)CHO$. Molar solns. of *dl*-$HOCH_2CH(OH)CHO$ were treated with various concns. of KOH from 0.2 to 6 *N* at 25° and 50°. The HCO_2H production at 50° is an increasing log. function of the KOH concn until a concn. of 0.7 *N* is reached, after which it is a decreasing log. function of the alkali concn. The HCO_2H sources

are thought to be the decompn. of AcCHO and the triose enediol. The AcOH production is also an increasing function of the alkali concn. to 0.6 *N*, after which it is a decreasing function. The source of the AcOH is believed to be a splitting of AcCHO. A new method has been developed that permits the detn. of AcOH quant. in the presence of HCO_2H and non-acid reducing agents. The AcOH production is an increasing function of the temp. In general, the HCO_2H yields are higher than an equimol. ratio at 50° when referred to the AcOH yields but the tendency of the HCO_2H yields is to approach this ratio as the alky. increases. The lactic acid production is an increasing function of the alkali concn., although it rapidly approaches a const. value. At low normalities the lactic acid production is an increasing function of the temp. At high normalities the const. value is slightly higher for the reaction at 25° than at 50°, because of tar formation at the higher temp. The $HOCH_2CH(OH)CHO$ is believed to form AcCHO before changing to lactic acid. *M* $HOCH_2CH(OH)CHO$ solns. treated with $EtOH-PhNHNH_2$ in the presence of various concns. of KOH at 25° and 50° show that the production of AcCHO osazone at 25° is an increasing function of the alkali until a concn of 1 *N* is reached, after which it is a decreasing function. At 50° the same is true except that the max. production is at approx. 0 5 *N*. The reaction is of the 1st order The lowering in the curve after the peak is reached is believed to be due to increasing conversion of the AcCHO into lactic acid. The theoretical interpretation of the results is in harmony with that for the behavior of *d*-glucose and *d*-galactose under similar exptl conditions. C. J WEST

Formation and stability of spiro-compounds. XIII. Spiro-compounds from the substituted levulinic acids. EUGENE ROTHSTEIN AND J. F. THORPE. *J. Chem. Soc.* **1926**, 2011–7 —The anhydride (I) of 1-carboxycyclohexane-1-acetic acid (II) is best obtained by distg **II** under reduced pressure through a wide air condenser (yield, 76%). EtONa added slowly to 65 g. **I** in abs EtOH gives 70 g. of the Et ester of **II**, b_{11} 175 80°; the acid chloride from 60 g ester added to MeZnI gives 20–30 g. crude ester, b_{14} 144–54°, which, boiled with EtOH-KOH, gives *1-acetylcyclohexane-1-acetic acid*, m. 82° (*semicarbazone*, m 212°), the acid is not attacked by PBr_5, PCl_3 or AcCl; *Et ester*, b_{15} 155°. With dry EtONa the ester gives 48% of *cyclohexanespirocyclopentane-2,4-dione*, m. 180°, decolorizes cold alk $KMnO_4$ and is unchanged by boiling 50% KOH. NaClO gives **II.** Titration with Br shows 69 4% enol. Br in CCl_4 gives *cyclohexanespiro-3-bromo-Δ^2 cyclopenten-2-ol-4-one*, m. 238°; $FeCl_3$ in EtOH gives an intense crimson color. Et β,β dimethyllevulate and EtONa give 20–5% of 1,1-dimethyl-Δ^2-cyclopentan-2-ol 4-one, which was not purified but isolated as the *3-Br deriv.*, m. 203°; EtOH-$FeCl_3$ gives a blood-red color. C J. WEST

The composition and structure of organic compounds. HEINRICH RHEINBOLDT *Z angew Chem* **39**, 765–7(1926) —A statistical study of aromatic hydrocarbons, amines and phenols J. H. PERRY

Directive influence in the benzene ring. A. W. FRANCIS. *Chem. Reviews* **3**, 257 89 (1926), cf. *C. A* **20**, 2316.—A review of directive influence of substituents as contrasted with the orienting effects of temp., concn. and identity of entering group (cf *C A* **18**, 3175) Directive influence is explained by partial shifts of electrons of which 3 are shared in each nuclear bond. 89 references are included. A. W. FRANCIS

Stereochemical research in the styrolene series: the ω-ethoxystyrolenes. CHAS. DUFRAISSE AND RENÉ CHAUX *Bull. soc. chim.* **39**, 905–22(1926).—One of the isomeric ω-ethoxystyrolenes (I), m —1° to 0°, b_{11} 102–3°, $d_4^{19.6}$ 0 976, n_D^{23} 1.550, mol. ref. 46.77, was prepd by removing 1 mol of alc from $PhCH_2CH(OEt)_2$ which was made from $PhCH_2MgBr$ and $HC(OEt)_3$. I can also be prepd by treating α-ethoxybenzalacetophenone with KOH, taking precautions against oxidation. It was found that small quantities of *o*- or *p*-$C_6H_4(OH)_2$ would prevent autoxidation in these compds. R. C. ROBERTS

Coupling action of the Grignard reagent. II. Methylmagnesium iodide and the benzyl halides. R. C. FUSON. *J. Am. Chem. Soc.* **48**, 2681–9(1926); cf. *C. A.* **20**, 1230 — When the benzyl halides react with MeMgI in excess the products are PhEt, C_2H_6 and $(PhCH_2)_2$ $PhCH_2CHPhCH_2Ph$ is not produced under these conditions. Approx. 25% of the benzyl halide is methylated; the remainder of the halide undergoes the coupling reaction, forming C_2H_6 and $(PhCH_2)_2$. An app. is described for measuring the gas evolved by reactions carried out in Et_2O. C. J WEST

Reaction between organomagnesium halides and the esters of some sulfur acids. HENRY GILMAN, JACK ROBINSON AND N. J. BEABER. *J. Am. Chem. Soc.* **48**, 2715–8 (1926) —No alkylating action has been observed in the reactions between organomagnesium halides and the esters of SO_2H, SOH, COSH, CSOH and CS_2H acids. Bu_2-

PhMgBr give 40% Ph_2SO and 44% BuOH. *p*-MeC_6H_4 ve 57.2% $PhCH_2SOC_7H_7$. *p*-$MeC_6H_4SO_2Bu$ and PhMgBr ʼh and 67% BuOH. Ph_2SO_3 and PhMgBr give about 70% SO_2Et and $PhCH_2$- PhSOMe and PhMgBr give 48.4% Ph_2S. PhCOSEt and PhMgBr give 46% *p*-Me- and EtSH. PhCSOEt and PhMgBr give 28.1% Ph_2CO. Ph_2SO and 86% MgBr give 78%

ıration of monophenols and monoethers of diphenols. R. ... J. WEST *him* [8] **3,** 507–9(1926).—The $Sr(OH)_2$ method of sepn. is useless; ren... ...RRE. J. HI and subsequently distg. off the monophenols with steam will effect a quant. removal of
S. WALDBOTT ...nt.

:t of substituents on the formation and reactions of certain ethers. L. C. AND J. C. COLBERT. *J. Am. Chem. Soc.* **48,** 2652–62(1926); cf. *C. A.* **20,** ·$O_2NC_6H_4Cl$ and *p*-$O_2NC_6H_4Br$ with MeOH or EtOH give a mixt. of ether and riv.; the latter with PrOH gives mostly azoxy deriv. and with allyl alc. 40% ɔxy deriv. 2,5-$Cl_2C_6H_3NO_2$ and MeOH give 92% of ether, EtOH, 33 9% ether alc. only azoxy deriv. 2,5-$Br_2C_6H_3NO_2$ and MeOH give 85.7% ether; EtOH, her. 2,4-$(O_2N)_2C_6H_3Cl$ and MeOH give 94 7% ether; EtOH, 68.8% ether; 65.8% ether. The formation of Ph alkyl ethers by treatment of halogenated ith aq. alc. KOH is dependent upon the no. and relative positions of the NO_2 he reducing action of the alc., the concn of the reacting components and temp. ion between a halogenated $PhNO_2$ and a PhOH is influenced most noticeably bstituent in the PhOH. When the latter contains a NO_2 radical, the reaction ınless the halogenated C_6H_6 contains more than 1 NO_2 group. 2,4-$(O_2N)_2$- ıve the following yields of ethers: with PhOH, 92%; 2,4-$(O_2N)ClC_6H_3OH$, $_2NC_6H_4OH$, 90.5%; 4-$O_2NC_6H_4OH$, 97%; 2,4-$(O_2N)BrC_6H_3OH$, 94.9% 2,4- I_3OH did not react with PhCl, 2,5-$Cl_2C_6H_3NO_2$, 2-$O_2NC_6H_4Cl$, 4-$O_2NC_6H_4Cl$ $C_6H_3NO_2$. Br does not readily substitute in the Ph radical of Ph alkyl ethers ˙ the 3 possible positions are occupied by substituents other than H; when ·presented by allyl, the latter will be satd. with Br. Ph $PhCH_2$ ethers are into the corresponding brominated PhOH and $PhCH_2Br$ The presence of ical in Ph_2O hinders the entrance of Br, regardless of the solvent used The of Ph alkyl ethers by HBr under the conditions specified is not complete and be influenced by substituents in the Ph nucleus When alkyl is represented .he splitting is nearly quant Ph_2 ethers are unaffected by HBr 4,2-Cl- $_3OMe$ is obtained in 51 6% yield by reducing the NO_2 compd. with Al-Hg; y deriv. is also formed; *Bz deriv*, m 77 5°. 4,2-$Cl(O_2N)C_6H_3OEt$ results in hydrolysis of the $ClC_6H_4NO_2$; this does not react with Br in AcOH Re- ʼes the base, which could not be isolated; the *Bz deriv.*, m. 119°. *2-Nitro-4- ıl allyl ether,* m. 46°, in 77% yield from the Ag salt of the phenol and allyl $ClC_6H_4NO_2$ and allyl alc. gave only the *tetrachloroazoxybenzene,* yellow, m. $H_2N(O_2N)C_6H_3OEt$ is formed in 48 5% yield, the *Bz deriv.*, yellow, m 135– $_2N)_2C_6H_3OCH_2CH{:}CH_2$ is obtained in 66% yield from 2,4-$ClC_6H_4NO_2$ lc.; Br gives an addn. product, m. 108 5°; HBr decomps the ether quant.)C_6H_3OAg and $PhCH_2Cl$ give 10% of the ether; the K salt in H_2O and Ph- ed 2 hrs at 125–60°, give 51%; with 5 mols Br the ether gives 2,4,6-(O_2N)- H. 2,4-$(O_2N)_2C_6H_3OCH_2Ph$ results in 36% yield by the Ag salt method; ·$(O_2N)_2C_6H_3Cl$, $PhCH_2Cl$ and H_2O at 150° for 10 hrs. gives 52%; 4 hrs' es 43%. The following *ethers* were prepd. by heating *p*-$O_2NC_6H_4Cl$ and erivs. of these; the m. p. and yield are given. *4-Nitrodiphenyl,* 60–1°, $(O_2N)_2C_6H_3OPh$, 70°, 92.6%; 5 mols. Br give the *4'-Br deriv.*, m 138 5°, is also obtained from 2,4-$(O_2N)_2C_6H_3Cl$ and 4-BrC_6H_4OK. *2,4-Dinitro- ıenyl,* yellow, m 123°, 96.6%. *2,4,2'-Trinitrodiphenyl,* yellow, 137.5° *ʼ'-trinitrodiphenyl,* yellow, 135°, 76 8%; *2,4,4'-trinitrodiphenyl,* yellow, 116°, *'initro-2',4',6'-tribromodiphenyl,* 130.5°, 27.7%; *2,4,2'-trinitro-4'-chloro-* llow, 154°, 86.9%; the corresponding *4'-Br deriv.*, 148.5°, 94.9%; *2-nitro- enyl,* 45.5°, 72.2%; *2-nitro-4'-bromodiphenyl,* yellowish green, 71°, 70%; *orodiphenyl,* 76.5°, 81%; *4-nitro-4'-bromodiphenyl,* brownish, 65–6°, *itro-4-chlorodiphenyl,* lemon-yellow, 36–7°, 67.5%; *2-nitro-4-chloro-4'- ıl,* pale yellow, 93–4°, 91.2%; *2-nitro-4,4'-dichlorodiphenyl,* pale yellow, the *4,4'-dibromo deriv.*, yellow, 94 5°, 91.9%; the *4-bromo-4'-chloro deriv.*, , 100.5°, 91.9%.
C. J. WEST

ion in the benzene ring. The chlorination of pyrogallol 2,6-dimethyl ether. LEVINE. *J. Am. Chem. Soc.* **48,** 2719–21(1926).—2,6-$(MeO)_2C_6H_3OH$ ½ give 80% of the *3-Cl deriv.* (I), b_{12} 154–6°; *benzoate,* m. 89–90°; *4,5-Br* 4–5° (acetate, m. 107–8°; benzoate, m. 119–20°). Oxidation of I gives

of *3,3'-dichloro-2,6,2',6'-tetramethoxybiphenoquinone* (II), has a grayish purple and differs from cedriret in not giving a blue color with concd. H_2SO_4. Oxidation II gives $3,5,2,6,4\text{-ClBr(MeO)}_2\text{(O:)C}_6\text{H:O}$, almost quant. reduced by SO_2 to 3-chloro-bromo-2,6-dimethoxyhydroquinol, m. 146°, whose *diacetate*, m. 85–6°. Thus in the chlorination of $2,6\text{-(MeO)}_2C_6H_3OH$ the 1st substituent Cl enters in the *m*-position to the HO group. C. J. West

New oxidation product from quinone. Ethel M. Terry and N. A. Milas. *J. Am. Chem. Soc.* **48**, 2647–52(1926).—A mixt. of 100 g. $p\text{-}C_6H_4(OH)_2$, 400 cc. H_2O, 150 g. $NaClO_3$, 50 cc. *N* HCl and 10 cc. of 1% OsO_4, shaken 54 hrs., gives 50% of *dihydroxyhydroquinone* (I), $C_6H_6O_4$ (by mol. wt. detns.), m. 177–8°. Heating 48 hrs. with 4 parts Ac_2O gives the *tetraacetate*, m. 139°. Absorption spectra and the chem. properties of its solns. indicate that I undergoes tautomeric changes; the tautomer formed by treating I in H_2O with alkali and then with acid is a polyhydric phenol, since an excess $FeCl_3$ gives an intense blue color and the aq. soln. reduces $AgNO_3$ in acid soln. I (5 g.) in cc. Ac_2O and 5 cc. H_2SO_4 give the *compd.* $C_{20}H_{16}O_{10}$, m. 217–8°; if only a few drops H_2SO_4 is used, the *compd.* $C_{24}H_{22}O_{13}$ is formed also. I and BzCl in C_5H_5N give the *tetrabenzoate*, m. 191–2°, mol wt. 526. I, dissolved in alkali, made acid and allowed to stand with NaBr and Br, gives a yellow compd. with 77.4% Br, m. 285°. I in alk. soln., allowed to stand at room temp. for some time, binds 2 equivs. alkali; attempts to oxidize the rearranged substance have been unsuccessful. $PhNHNH_2$ gives as the final product a compd. with 22.9% N. Cryst. compds. are obtained with NH_2OH, $PhNH_2$, $Hg(OAc)_2$. HNO_3 oxidizes I to $(CO_2H)_2$. C. J. West

Use of leucotrope as a benzylating agent. Hla Baw. *Quart. J. Indian Chem. Soc.* **3**, 101–4(1926).—Leucotrope, $PhCH_2PhMe_2NCl$, prepd from $PhNMe_2$ and $PhCH_2Cl$, readily gives aromatic benzyl ethers by heating 4 hrs. with phenols in presence of NaOH or Na_2CO_3. Nitro derivs. react similarly. Thus were prepd. $\alpha\text{-}C_{10}H_7OCH_2Ph$, m 75°; $PhOCH_2C_6H_4NO_2\text{-}p$, m. 91°; $PhOCH_2Ph$, m. 39°; $o\text{-}MeC_6H_4OCH_2Ph$, 284°; *m*-compd , m 43°; *p*-deriv., m. 40°; benzyl β-naphthyl ether, m. 100°; $p\text{-}O_2NC_6H_4OCH_2Ph$, m 91°; $p\text{-}O_2NC_6H_4OCH_2Ph$, m. 106° (all known previously); *benzyl o-tolyl ether*, m. 296°; *m*-compd., m 59°; *p-isomer*, m. 71°; *benzyl 2,4-dichlorophenyl ether*, m 60°. A. W. Francis

preparation of piperonylic acid from piperonal. E. Cattelain. *Bull. soc. chim.* **39**, 1186–88(1926).—Piperonylic acid is obtained from piperonal in 70% yield by careful oxidation with alk. $KMnO_4$. Reynold C. Fuson

Synthetic work in the camphor and terpene series. Gustav Komppa. *Z. angew. Chem.* **39**, 952–3(1926).—A brief review with about 20 references. C. J. West

The caryophyllene alcohols and their occurrence in nature. J. M. Robertson. *Nature* **118**, 156(1926); cf. *C. A.* **20**, 1072.—Caryophyllene alc. (I), obtained from caryophyllene (II) by Wallach's hydration method, has a different ring configuration from that of II and so could not occur in plants as the parent compd of II. Another caryophyllene alc , caryophyllol (III), synthesized from II, retains the dicyclic structure of II and might be the natural parent of II. Evidence for this theory is the fact that a dicyclic sesquiterpene alc. from an oil from clove stems has properties practically identical with those of III. Margaret W. McPherson

Complex salts of quinoline, mercuric halides and alkali halides and some isomers. W. M. Dehn and Harvey Cope. *J. Am. Chem. Soc.* **48**, 2634–42(1926); cf. *C. A.* **20**, .—The following salts were prepd. in anhyd. solvents (Me_2CO, MeEtCO, MeCN or ...). Quinoline (I) and EtCl do not react in the sunlight after several days; even ... both components were present in the mixt. *I.EtCl*, m. 122°; *I.EtBr*, m. ... m. 158°; *I.iso-PrI*, m 136°; *I.BuI*, m. 174°; *I.iso-BuI*, m. 161°; *I.cetyl* ... 101°; $I.C_{16}H_{33}I\ I_2$, m. 70°; $I.C_{16}H_{33}I.Br_2$, m. 80°. Compds. of the type ... are best prepd. from mol. equivs. of I.RI and HgI_2 in hot MeCN, Me_2CO ...); R = the following: *Me*, m. 165°; *Pr*, m. 155°; *iso-Pr*, m. 128°; *Bu*, m. 122°; ... 151°; *iso-Am*, m. 160°; *cetyl*, m. 87°. $I.HgI_2$ and I.MeI in hot Me_2CO ... complex $I.MeI\ HgI_2.I$, yellow, m. 170°. The *Pr compd.*, yellow, m. 108°, ... *compd.*, m. 86°. Compds. of the type $2(I.RI).HgI_2$ are characterized by ... in Me_2CO or MeEtCO and great soly. in MeCN, from which they are pptd. R = the following: *Me*, m. 210°; *Pr*, m. 157°; *iso-Pr*, m. 160°; *Bu*, m. ...*u*, m. 168°; *iso-Am*, m. 156°, *cetyl*, m. 84°. Of the type $I.HgI_2.RX$, ...s. where R = *iso-Pr* (m. 128°) and *sec-Bu* (m. 130°) were obtained. Of the ...I_2.RI, compds. with R = *Et*, m. 140°, and *Pr*, m. 125°, were obtained. ...eI, yellow, m. 190°. $2I.HgI_2.3PrI$, yellow, m. 125°. $4I.2HgI_2.3$(iso-...t yellow, m. 124°. Of the type $3I.3HgI_2.2RI$, compds. were prepd. where ... 160–8°, *Pr*, m. 118–25°, *Bu*, m. 158°, and *iso-Am*, m. 140–60°. Compds.

of the type I.EtI.HgX_2 were prepd. where X = *Cl*, m 133°, *Br*, m. 143–6° and *I*, m. 131°; I.EtBr.HgX_2, where X = *Cl*, m. 193°, *Br*, m 169° and *I*, m. 121°. I.HgI_2.-EtI, yellow, m. 131°; melting gives the stable isomer, I.EtI.HgI_2. I.$HgBr_2$.EtI_2, yellow, m. 125°. Compds. of the type 2I.2EtX HgY_2 were prepd as follows: X = *Cl*, Y = *Cl*, m. 232–5°; Y = *Br*, yellow, m 221 3°, Y = *I*, yellow, m 173–5°; X = *Br*, Y = *Cl*, m. 177–80°; Y = *Br*, m. 189 90°; Y = *I*, yellow, m. 173°; X = *I*, Y = *Cl*, yellow, m. 155°; Y = *Br*, yellow m. 174°; Y = *I*, yellow, m. 188°. C. J. WEST

How I have been led to the direct hydrogenation method by metallic catalysts (SABATIER) 2. The crystallography of trimethylenetrinitroamine (TERPSTRA) 2. Crystals of some organic compounds (BUTTGENBACH) 2. Mechanism of chemical transformation (LOWRY) 2. Electrochemical oxidation of organic substances (FICHTER) 2. Organic crystals (BRAGG, *et al*) 2. Column still for rectifying alcohol (U. S. Pat. 1,601,320) 1.

Mitsuru Kuhara's work on the Beckmann rearrangement. Edited by SHIGERU KOMATSU. Kyoto, Japan: Kyoto Imperial Univ. 83 pp.

Tartrates. CHEMISCHE FABRIK DR H STOLTZENBERG Brit 242,590, Nov. 5, 1924. Salts of fumaric or maleic acid (which may be formed for the purpose, *e. g.*, by the addn of $CaCO_3$ to the free acid) are halogenated and the product is heated in the presence of a carbonate or bicarbonate, *e g*, $CaCO_3$, and treated with a halogenating agent such as Br. On heating with a reflux condenser, tartrate is produced

Oxalates and oxalic acid. W WALLACE U S 1,602,802, Oct. 12 A mixt. of H_2O and substantially equiv quantities of $Ca(OH)_2$ and Na oxalate is treated with CO at 130° under 65 lbs pressure per sq in until absorption ceases, to form Ca oxalate

Phenylhydrazine derivatives. T SUZUKI and S SAKURAI. Brit 242,721, Aug 18, 1924. An acid which with its salts strongly absorbs ultra-violet rays is obtained by condensing phenylhydrazine-*p*-sulfonic acid with grape sugar or invert sugar. In the presence of NaOAc the Na salt is obtained and is pptd by adding alc. Sp. reference is made to the K and Pb salts

Acetic acid. H. SUIDA. Can 263,555, Aug 17, 1926 AcOH is extd from a superheated mixt of AcOH and water vapor with AcOH solvents having higher b. ps. than that of AcOH and insol or sparingly sol in water The solvents contg AcOH are recovered and the acid is sepd by distn Cf. *C. A.* **19,** 523.

Apparatus for oxidizing acetaldehyde to produce acetic acid. E. G. THORIN. U. S. 1,601,891, Oct. 5.

Lactic acid ester. H W MATHESON and K G. BLAIKIE Can 263,186, Aug. 3, 1926. Et lactate is produced by causing acetaldehyde-cyanohydrin and EtOH to react together in the presence of HCl and less water than will serve to hydrolyze all the cyanohydrin to lactic acid

Vinyl ester. W. O HERRMANN and E. BAUM. Can. 264,158, Sept. 7, 1926. C_2H_2 is passed through an org. acid in the presence of not more than 4% by wt. of Hg compds. The generated vinyl ester is removed from the reaction liquid immediately after its formation by passing an excess of C_2H_2 through the reacting liquid. Cf *C. A* **20,** 2333.

Crotonaldehyde, aldol, butyraldehyde and butyl alcohol. CARBIDE AND CARBON CHEMICALS CORPORATION. Brit 242,521, March 31, 1925 Crotonaldehyde is made by subjecting aldol to a temp not exceeding about 165° in an inert atm such as N. The process may be carried out continuously The crude crotonaldehyde may be purified by fractionation in an inert atm and used for production of pure butyraldehyde and BuOH by hydrogenation The aldol used for the reaction should be made and stored in an atm. of N, C_2H_2 or other non-oxidizing gas.

Anhydrides of disaccharides. A. PICTET U. S. 1,602,549, Oct. 12. Disaccharides such as sucrose or lactose are heated to a temp. of about 185° or higher under reduced pressure to obtain anhydrides and their polymerization products.

Saccharin. J. W. ORELUP. U. S. 1,601,505, Sept 28. *o*-Toluenesulfonamide is subjected to the oxidizing action of chromic acid mixed with H_2SO_4 and of over 50% concn.

Organic mercury compounds. FARBENFABRIKEN VORM. F. BAYER & CO. Brit. 242,669, Nov. 10, 1924. Phenol-Hg compds. are obtained by allowing a soln. of $HgSO_4$ in H_2SO_4 or other suitable Hg salt soln. to flow into a hot Na_2CO_3 soln. of *o*-nitrophenol or other heated alk. soln. of a halogen-, nitro-, or halogennitro-phenol. Sufficient alkali is used that the reaction mixt. becomes acid only after decompn. is complete. The product is obtained on cooling and settling.

Hydrocarbon compound. E. B. SPEAR. Can. 264,324, Sept. 14, 1926. CH_4 is passed through a heated retort to yield H_2 and C; a part of the C is deposited in the retort, and steam is thereafter passed through the retort while heated to combine with the C and yield a mixt. contg. CO and H_2.

Concentrated formaldehyde. M. MUELLER Can. 264,342, Sept. 14, 1926. A weak soln. of CH_2O is refluxed until an equil has been established between the CH_2O and its polymers and hydrates. The soln. is then fractionally distd.

Thiazoles. L. B. SEBRELL and C. W. BEDFORD. U. S 1,591,440, July 6. In making arylthiazoles, *e. g*, mercaptobenzothiazole, an aryl substituted thiourea, *e. g*, thiocarbanilide, is heated with S. By the use of a greater proportion of S, mercaptobenzothiazole disulfide or polysulfide is formed. These and similar compds. may be used as *accelerators in vulcanizing rubber.*

Hydrogenated dihydroxydiphenylmethane compounds. H. JORDAN. U. S. 1,593,080, July 20 4-Hydroxy-3-methylcyclohexyl-4-hydroxy-3-methylphenyldimethylmethane, $b_{0.8}$ 218°, solidifies in the cold into glassy masses, is obtained by treating $(3,4\text{-}Me(HO)C_6H_3)_2CMe_2$ with H under pressure at 150 170° in the presence of a Ni or other hydrogenating catalyst. 4-Hydroxycyclohexyl-*p*-hydroxyphenyldimethylmethane, $b_{0.8}$ 213°, is similarly formed from $(4\text{-}HOC_6H_4)_2CMe_2$ U. S 1,593,081 specifies carrying a similar hydrogenation to a further degree to obtain compds. such as: (*a*) di-4-hydroxycyclohexyldimethylmethane, b_{12} 102 6° and having an odor of lilies of the valley; (*b*) di-4-hydroxy-3-methylcyclohexyldimethylmethane, b_{12} 108–12° and having an odor resembling hyacinths; and, (*c*) di-4-hydroxycyclohexylmethylethylmethane, b_{14} 120–5° and having an agreeable flowery odor.

Diaminodiaryldialkylmethanes. B HOMOLKA. U. S. 1,591,384, July 6. Diaminodiphenyldimethylmethane, m. 132°, or compds of the same general type are colorless substances, m without decompn, insol in cold H_2O and alkali, slightly sol in boiling H_2O and readily sol in the common org. solvents and mineral acids. They may be formed by causing a primary aminobenzene with an unoccupied *p*-position, in the form of its salts, *e g*, aniline hydrochloride, to react upon aliphatic ketones, *e g*, acetone. Diaminodi-*o*-tolyldimethylmethane, m 71°, and diaminodiphenylmethylethylmethane, m. 78°

Derivatives of 4-hydroxypiperidines. H STAUDINGER. U S. 1,567,200, Dec. 29, 1925. See Brit 232,207 (*C. A.* **19,** 3492)

Purifying acetylene. CHEMISCHE FABRIK GRIESHEIM-ELEKTRON AND A. HERMANN. Brit 243,607, Apr 24, 1925. A purifying material for C_2H_2 or other gases is prepd from chloride-free basic Ca or Mg hypochlorite, contg 30-40% available Cl, by mixing it with cement or plaster and H_2O as a binder The material may be rendered porous by addn of Al or of Mg or its alloys, or NH_3 and H_2O_2 may be used (but are less suitable).

Ketene. D. A. NIGHTINGALE. U. S. 1,602,699, Oct. 12. Acetone or similar org. compds which are decomposed by heat into substances including ketene are subjected to a decompg temp. (which may be approx. 635° with acetone) in the presence of $Al_2(SO_4)_3$ or other sulfates which act as "preventive catalysts" and are not decompd. at the temp. employed The catalyst acts to counteract the tendency to decompn of the ketene and an approx. quant. yield of ketene is obtained.

Pure anthracene and carbazole from crude anthracene. L. WEIL. U. S. 1,601,749, Oct 5 Crude anthracene is submitted to distn. in mixt. with hydrocarbons b. 260–315°, such as gas oil and the vapors are passed in contact with alkali metal hydroxide to effect sepn. of the carbazole as alkali metal carbazolate. Cf. *C. A.* **19,** 2960.

Nitro- and amino-2-substituted anthraquinones. J THOMAS and SCOTTISH DYES, LTD. Brit 243,505, July 2, 1924. *p*-Substituted benzoylbenzoic acids are converted with strong H_2SO_4 or "weak oleum" into 2-substituted anthraquinone derivs which are nitrated in the same H_2SO_4 soln. without sepn. The crude products, which contain small quantities of oxy compds, can be reduced with an alk. reducing agent to form corresponding amino compds., the oxy compds. remaining in the alk. soln.

Benzanthrones. F. W PECK and J H. SACHS U. S. 1,601,319, Sept. 28. Anthranol or other anthracene compd. free from N is heated with glycerol in the presence of an oxidizing agent such as, preferably, anthraquinone.

Benzanthronyl nitriles. KALLE & CO. AKT.-GES. Brit. 243,026, Nov. 17, 1924. Cuprous cyanide is caused to act upon halogenated benzanthrones either with or without the presence of a solvent of high b. p. These nitriles yield vat dyes when fused with alk. agents such as NaOH or Na amide.

Tetraglucosan. J. KERB. Brit. 243,348, Nov. 20, 1924. Tetraglucosan is prepd. by heating grape sugar, under diminished pressure or in an inert gas, in the pres-

ence of a small quantity of $FeSO_4$, $MnSO_4$, Ni or other suitable metal or metallic s. acting as a catalyst, with or without diluents such as vaseline oil or phenanthrene.

Purifying alcohols. M. D. Mann Jr., and R. B. Lebo. U. S. 1,601,404, Sept 28. In purifying alcs., especially isopropyl alc. prepd. from hydrocarbons, they a treated with $FeCl_3$ or other suitable chloride of a heavy metal and with free Cl. Ch rides of Zn, Mn, Sn, Pb, Ni, Co and Cu may be used. Cf. *C. A.* **19**, 3272.

Purifying aromatic alcohols, acids or salts. M. E. Putnam and J. W. Britt U. S. 1,601,509, Sept 28. In removing halogenated impurities from aromatic al acids or salts, *e. g.*, benzoic acid, they are heated to 100–400° with an aq. alk. soln. su as aq. NH_3. Cu_2Cl_2 may be used as a catalyst

Methanol. S. P. Burke. U S 1,602,846, Oct 12. Direct hydrolysis of ' ether is effected by steam at a temp of about 350–375° and in the presence of Al or an equiv. hydrolyzing agent

11—BIOLOGICAL CHEMISTRY

PAUL E. HOWE

A—GENERAL

FRANK P UNDERHILL

Physicochemical studies of the mechanism of blood clotting. I. N. Kugelm *Third Colloid Symposium Monograph* **1925**, 158–207.—Expts. on p_H changes dur clotting "establish conclusively that fibrin formed as an amphoteric protein ha H-ion concn. lower than the initial c_H of the mixt of all components necessary and ficient for clotting This fundamental fact puts to serious question all previous c parisons of the initial and final components and their properties, since such stu were made at two distinctly different H-ion concns. and are, therefore, incomparal There is always a diminution in the H-ion concn. on coagulation, irrespective of original value, this diminution being greater the higher the original c_H; 50 ± % H disappear. In 24 hrs at 38°, clotting occurs only between p_H 5 and p_H 8, the velo diminishing on either side of neutrality, but more so on the OH side Clotting mum is about p_H 7. Increasing c_{OH} refines the fibrin fiber, which at p_H 8 bec invisible ultramicroscopically. On neutralization, blood of excessive c_H or c_{OH} c the thrombin being obviously unaffected Elec cond diminishes during clotting of ionic Ca accounting for this in part. Ca ions favor clotting and syneresis m than do Na ions The Ca ion concn is regulated by Ca buffers, mixts. of weak a and their salts reacting to form insol normal Ca salts, and sol intermediate Ca s The Ca-ion concn. of such buffers is expressed by $Ca^{++} = K[HA]^n/[BA]^{2n}$, wh HA = concn. of free buffer acid, BA = concn. of free buffer salt, n = valence of Ca to acid, K = equil const Expressed logarithmically, the Ca-ion concn $\log 1/[Ca^{++}] = p_{Ca} = p_K + n \log [BA]^2/[HA]$ With carbonates as Ca ion buffe $p_K = 4.2$ at 38°. The Ca-ion buffer value of a soln is the no. of g. equivs of Ca or acid needed to change the Ca-ion concn. one unit of p_{Ca}, and is expressed by $d[BA]/dp_{Ca}$. The general equation for Ca buffer value, ρ, is $\rho = d[BA]/dp_{Ca} = 2.3/nK'a[C]\cdot[H^+]/(K'a + [H^+])(K'a + 2[H^+])$; for carbonates $n = 1$, for phosphat $n = {}^2/_3$. At any p_H the Ca-ion buffer value varies as the total concn. of buffer acid salt, and is independent of the nature of the weak acid, providing it forms an in Ca salt. With mixed buffers, the effects are additive. The max. Ca buffer va occurs with 0.586 parts buffer salt and 0.414 parts buffer acid, the molal Ca-ion bu value then being given by $p_H = pK'a + \log \sqrt{2}$, where p_H is 6.30 for carbonates a 7.00 for phosphates. With normal blood Ca ion buffer value of its serum carbona at p_H 7.35 is 3.5×10^{-3}; serum phosphates 0.5×10^{-3}; combined value 4.0×10^{-3} The protective power of protein components increases during clotting, reaching max. on syneresis. Coagulation speed is directly detd. by *serozyme*, which is associate with serum proteins in the thrombin solns., and which is a highly dispersed, thermol bile catalyst. Viscosity changes during clotting are at first slight, then rise rapidly fro a definite inflection point, to a max. when syneresis begins, and sink to a min for th exuded serum. Analogous transparency changes were demonstrated by a newly de vised *nephelelectrometer*, which may be used for *detn. of degree of dispersion in colloid systems*. The fibrinogen-fibrin transition involves increase in colloidal stability, an degree of dispersion of the medium. Coagulation is an *autocatalytic* process involvi (1) a slow latent precoagulation period, wherein the electronegative serozyme nucl

condense on the electropositive fibrinogen micellae surfaces, the system being then hydrophile and reversible; (2) a short clotting period, wherein the spherical units formed in (1) form a continuous reticulum by elec. discharge and coalescence. The coagulation rate of plasma or fibrinogen is of the same order as most biologic reactions. A new *torsion viscometer* and *inverse ultrafilter* were used in this work. JEROME ALEXANDER

Reversible gel formation and fixation. M. A. VAN HERWERDEN. *Nederland. Tijdschr. Geneeskunde* **70,** II, 245–54(1926).—The liquid protoplasma of protozoa is transformed into a gel by AcOH; if dil. acid is used this process is reversible. It can be observed wlth *Paramecium, Euglena,* various *Amoebae* and also with red blood cells and various other cells. A reversible gel formation may also be brought about by moderate heat. Ra increases the permeability of the cell membrane, which causes AcOH to penetrate more rapidly and produce reversible gel formation. Reversible gel formation precedes the permanent irreversible gel formation. This can be shown even by studying the fixation of plain gelatin; if this is fixed by formol it at first is transformed into a reversible gel, which still melts when heated; later an infusible product is obtained. Similar processes occur if living cells are fixed by formol. R. B

The biochemistry of calcium. The practical application of our present knowledge of calcium metabolism. A. T. CAMERON. *Can. Med. Assoc. J.* **16,** 753–9, 759–64 (1926).—A review. A. T. CAMERON

Enzymic proteolysis. I. The structure of clupein. ERNST WALDSCHMIDT-LEITZ, ANTON SCHAFFNER AND WOLFGANG GRASSMANN. *Z. physiol. Chem.* **156,** 68–98 (1926).—The methods recently developed for the complete sepn of individual proteolytic enzymes have made available a new mode of attack for the study of protein structure. The 1st expts. were made with clupein because of its simplicity as compared with other proteins, its components being $^2/_3$ arginine and $^1/_3$ proline, valine, serine and alanine. Fractional hydrolysis was performed by the successive use of the following enzymes in varying sequence: "trypsin" (unactivated), "trypsin-kinase" (activated), papain-HCN and erepsin. At each step the increase in COOH and NH_2 groups was detd. The ratios of performance by the individual enzymes were found to be simple whole nos. For example, in the sequence: trypsin, trypsin-kinase, erepsin, the performance ratios were 1.3:1; in the sequence: trypsin, erepsin, trypsin-kinase, erepsin, the ratios were 1:1:1·2; and for the sequence: trypsin-kinase, erepsin the ratio was 2.1 In all 3 series the total increase in COOH and NH_2 groups was practically identical. On the basis of linkages subject to enzymic hydrolysis, groups are distinguishable which represent fifths and thirds of the total hydrolytic process. The combination of these groups may lead to inferences as to the structural arrangement of the mol. A surprising observation was the fact that trypsin-kinase performed $^2/_3$, while trypsin and trypsin-kinase in sequence performed $^4/_5$ of the complete hydrolysis. Again, after trypsin and trypsin-kinase has performed $^4/_5$ of the hydrolysis erepsin performs the other $^1/_5$, but by altering the sequence to: trypsin, erepsin, trypsin-kinase only $^3/_5$ hydrolysis occurs and a 2nd application of erepsin performs the remaining $^2/_5$. The sp adaptation of individual proteases is therefore not dependent on the rupture of different chem. linkages The sp. susceptibility of a given linkage in the mol. is detd. rather by the nature or no of the adjacent amino acid or polypeptide complexes. Enzymes from different sources may show a difference in behavior toward the products of partial enzymic hydrolysis, e g, after treatment with trypsin, clupein is further hydrolyzed by intestinal erepsin but not by yeast erepsin Papain-HCN performs $^1/_5$ of the total cleavage, either on the original clupein or after $^1/_5$ cleavage by trypsin. In either sequence these 2 enzymes perform $^2/_5$ of the total cleavage, but further cleavage by trypsin-kinase and erepsin varies according to the sequence of the 1st 2, the successive performances of the 2nd 2 then being reversed. The fact that the titratable COOH and Van Slyke NH_2 after complete enzymic hydrolysis, which were remarkabl uniform regardless of the sequence of enzymes employed, were less than the valu calcd for the sum of the component amino acids is explained by the assumption tha peptides resistant to enzymic action are formed Tertiary linkage between proline- and carboxyl would be characteristic of such peptides. The constancy of proportiona increase in basic and acidic groups during hydrolysis confirms Kossel's view that th guanidine grouping of the arginine does not function in the peptide linkages. A far as clupein is concerned, the evidence supports only the acid-amide theory of linka and not such structures as pyrrole and pyrazine complexes. **II. Enzymic hydrolysi of casein.** ERNST WALDSCHMIDT-LEITZ AND ERICH SIMONS *Ibid* 99–113.—Th simple protamine, clupein, which showed a definitely progressive hydrolysis under th influence of trypsin, trypsin-kinase and erepsin in varying sequences, is not attacke by pepsin. To include pepsin in the series a more complex protein, *viz.* casein, w

examd. by the method of fractional proteolysis. As indicated by the increase in titratable COOH, pepsin and trypsin each perform $^1/_5$ of the total possible enzymic hydrolysis regardless of the order in which they are introduced After digestion of the casein by trypsin and erepsin no further cleavage is effected by pepsin. It appears that the function of pepsin is detd. more by a special configuration of the protein components or by the size of the mol. than by a sp mode of linkage. Peptic hydrolysis of the tryptic digestion products exposes points of attack for the further action of the tryptic enzyme, it may be by diminishing the size of residual complexes. The hydrolysis by trypsin-kinase and erepsin amts to $^3/_5$, and by pepsin and trypsin-kinase to $^4/_5$ that of the sequence: trypsin-kinase, pepsin, trypsin-kinase, erepsin. If pepsin and trypsin are to be characterized by disaggregating, and erepsin by hydrolyzing action, the latter should predominate in quant. effect, but such is not the case. The evidence points to no structural peculiarity of the proteins in other than the chem. sense. A. W. D

Specificity of animal proteases. VI. The mode of action of pepsin. ERNST WALDSCHMIDT-LEITZ AND ERICH SIMONS *Z physiol Chem.* **156,** 114–27(1926); cf *C A.* **20,** 921.—The possibility of tracing the sp action of pepsin to definite chem alterations in the structure of the protein acted upon is doubtful This accounts for the fact that analytical methods of pepsin estimation are based predominantly on measurements of phys properties of substrates, *e g.*, soly , precipitability or colloidal character The conception of the protein mol as a composite of elementary complexes associated together by means of residual valences, and of proteolysis as a mere disaggregation of these complexes, does not harmonize, however, with the results obtained by a study of the sp. performances of individual proteases. The fact that pepsin does not hydrolyze simple peptides does not exclude the possibility that acid amide linkages of higher complexes are the point of attack. Peptic digestion does result in an increase in free COOH and NH_2 groups, and indeed in the proportion of 1:1, except in anomalous proteins such as those of the cereals where glutamic acid and proline constitute a larger proportion of the mol., or in gelatin which is characterized by its high proline and hydroxyproline content The deficiency in NH_2 groups liberated may be due here to formation of proline or NH_3 which do not appear in the NH_2 detn. The course of peptic digestion may be followed more accurately by measurement of the increase in COOH and NH_2 groups than by detn. of phys change, *e. g*, viscosity. The observation of Steudel, *et al.*(*C A.* 20, 3173, 3174) that the COOH liberated was far in excess of the NH_2 is attributed to faulty technic A. W Dox

The chemistry of sputum. HELMUTH REINWEIN. *Z. physiol. Chem* **156,** 144–52 (1926).—Four l of sputum were collected during a period of 6 weeks from a patient suffering from bronchiectasis and examd for org. bases. Histidine, neosine and putrescine were isolated and identified Another base, probably imidazolylacetic acid, was isolated but not positively identified No individual substance was obtained from the purine fraction and qual tests for uric acid were negative. Arginine was not found and tyrosine was definitely absent A W. Dox

Separation of oxidoreductase from the zymase complex. I. A. LEBEDEV. *Z physiol. Chem.* **156,** 153–8(1926).—The filtrate obtained after coagulation of yeast maceration juice at 60–5° decolorizes methylene blue although it is without action on sugar. It still contains the reducing substances which take part in this reaction through the agency of the oxidoreductase. A sepn can be effected by pptn. of the enzyme by MeAc or better by $(NH_4)_2SO_4$. A soln of this ppt. has no effect on methylene blue either in the presence or absence of AcH, but when added to the filtrate from boiled yeast juice, which alone is without effect, a strong decolorizing action is observed The boiled juice contains, besides oxidizable substances, a co-enzyme of oxidoreductase It is not yet known whether this co-enzyme is identical with cozymase. The filtrate obtained from the juice heated to 60–5° contains also carboxylase. Autolyzed yeast maceration juice yields an ext on boiling which contains considerable xanthine and hypoxanthine, which are good reducing agents in the above reaction, and also glutathione. A W Dox

Correction of the paper by Hans Fischer and Hans Hilmer: "Coproporphyrin synthesis by yeast and factors which influence it," and the "Comment," by Hans Fischer. O. SCHUMM. *Z. physiol. Chem.* **156,** 159–60(1926) —Polemical. A W Dox

Porphyrins from hydroxyhemin anhydride. A. HAMSÍK. *Z. physiol. Chem.* **156,** 218–30(1926).—Hydroxyhemin anhydride is suitable for the prepn. of hemochromogen and porphyrins. It is insol. in concd. H_2SO_4, but sol. in AcOH-HBr and in HCl-$SnCl_2$ AcOH-HBr converts it into Nencki's hematoporphyrin; HCl-$SnCl_2$ converts it into a mixt of porphyrins which have not been identified with any known porphyrins. The products obtained by the latter treatment were sepd. into 1 amorphous and 4 cryst. porphyrins,

differing in the color of their alk. solns., *viz.*, greenish blue, violet, red, orange-red and greenish red-brown. As a solvent for the HCl-$SnCl_2$, MeAc was chiefly used, but trials were performed with AcOH, H_2O and MeOH. Tests for porphyrin formation were also made with hydroxyhemin, hematin, chlorohematin and defibrinated blood. A. W. D.

Addendum to the paper "The natural porphyrins and porphyratins. VIII. The spectrochemical reaction of iron porphyratins with potassium hydroxide, sodium cyanide and hydrazine hydrate." O. SCHUMM. *Z. physiol. Chem* **156,** 268-9(1926); cf. *C. A.* **20,** 3018.—To obtain the characteristic 2-banded spectrum with more certainty the Fe-porphyratin to be examd. is suspended in H_2O and dissolved by the addn. of a drop of 15% KOH. Then $^1/_3$ vol. of KOH is added, $^1/_2$ vol. NaCN soln. and finally 1 or more drops of $N_2H_4.H_2O$ or still better $(NH_4)_2S$. A. W. DOX

Influence of the reaction on the protein-digesting power of papain. W. E. RINGER AND B. W. GRUTTERINK. *Z. physiol. Chem.* **156,** 275–324(1926).—The curve showing the relation between papain action on fibrin and reaction of the substrate reaches a 1st max. at p_H 2.5 and a 2nd max. at p_H 11. These 2 maxima are analogous to those of pepsin and trypsin, resp The curve shows also 2 smaller maxima, 1 at p_H 4.5 which applies also to the action of papain on protein and albumoses, and another at p_H 7 in the presence of phosphate which strongly activates the action of papain on fibrin These various maxima are believed to be dependent on the condition of the substrate and enzyme. A peptic and a tryptic enzyme could not be isolated from the papain prepn. although the latter showed both peptic and tryptic action on fibrin. The prepn behaved quite differently from a mixt. of purified pepsin and trypsin. The action of papain on blood serum protein and secondary albumoses was studied by means of the CH_2O titration. Only 1 optimal reaction was found, *viz* , p_H 3.75 for serum protein and p_H 4 for albumoses The activation of papain by NaCN is not perceptible at strongly acid reaction but increases with increasing p_H until at p_H 11 a strong activation is observed. It is assumed that activation is caused, not by HCN which in acid or even neutral reaction is scarcely dissociated, but by the CN ion. The peculiar changes of the digestion curves of serum protein and albumoses under the influence of NaCN are in harmony with this assumption. Since with these substrates the papain action is nearly suppressed at p_H 11, the CN activation is not observed as in the case of fibrin. The expts. are not at variance with the assumption that papain is essentially an individual enzyme. A. W. DOX

Addendum to the paper "Cholesterol as prosthetic group in serum globulin." N TROENSEGAARD AND B. KOUDAHL. *Z. physiol. Chem.* **157,** 62–3(1926); cf. *C. A.* **20,** 3017—The temp. at which the hydrocarbon $C_{16}H_{28}$ is formed during acetylation of serum globulin is 135° and not 115° as previously stated. After 2 acetylations at the lower temp. and extn. with Et_2O, thus removing any possible contamination with free cholesterol ester, the residue when further acetylated at 135° yields the above hydrocarbon. Traces of this substance obtained from albumin and globin by the same treatment are believed to be due to contamination with globulin. A. W. DOX

Insulin and cozymase. KARL FREUDENBERG AND WILHELM DIRSCHERL. *Z. physiol. Chem.* **157,** 64-75(1926).—The cozymase action of insulin and the insulin action of cozymase from lactic acid bacteria, reported by Virtanen, could not be corroborated A test of 7 com prepns of insulin showed for the most part no activation of cozymase-free bacteria Where a slight activation was observed it may be attributed to inadequate purification of the insulin, since the pancreas from which insulin is prepd. is known to contain co-zymase. Crude ext. of pancreas strongly activates cozymase-free bacteria, whereas the best insulin prepns. do not. Virtanen's observation that an insulin prepn. which activated washed bacteria did not activate washed dried yeast may be explained by the fact that dried yeast is more sensitive to the antiseptic present in the insulin prepn. The increase in blood sugar produced by cozymase prepn. and by insulin in the presence of certain salts does not postulate a similarity of action Small doses of cozymase were found to give a slight but uncertain lowering, and larger doses a slight rise in blood sugar which cannot be attributed to the small amt. of phosphate present. A. W. DOX

The structure of the histone of the thymus gland. II. Its acid and base binding power. K. FELIX AND A. HARTENECK. *Z. physiol. Chem.* **157,** 76–90(1926).—The acid- and base-binding power of a protein is an index of the no. of free basic and acidic groups present. The basic groups include free NH_2, the guanidine group of arginine, the free imidazole ring of histidine and possibly acid amide groups of peptide linkages. The acidic groups include COOH and probably the OH of tyrosine. Titration in alc soln. gives values representing only the COOH equiv. to the suppressed dissocn. of NH_2 groups. Likewise NH_2 detn. by the Van Slyke or the Sörensen method does not include

NH groupings as in histidine and guanidine. To ascertain the actual acid- and b: binding values electrometric titration must be employed. This may be done by n suring the p_H of solns. of an isoelec. protein in acids and alkalies of varying concn. : comparing the concn. with that of pure solns. of acid or alkali of equal p_H. The ference between the acid or alkali content of the soln. contg. the protein and tha the acid or alkali alone represents the amt. bound. The isoelec. point of histone found to be p_H 8.51. By electrometric titration the av. values for binding capa of 1 g. of histone were 0.54 millimols. H_2SO_4 and 1.49 millimols. NaOH. These val correspond to an equiv. wt. of 930 for acid binding and 670 for base binding. By c paring alc. with electrometric titration an interesting discrepancy is observed. ' former shows 8.75 and the latter 11.5 acid groups per 100 atoms N. The differe represents in all probability 3 acid groups already neutralized by guanidine. titration of arginine before and after neutralizing the aq. soln. to azolitmin confirn this view. A. W. Do

The application of the law of mass action to enzymic sugar and glucoside cleavag KARL JOSEPHSON. *Z. physiol. Chem.* **157**, 115–21(1926).—Hedin's assumption *A.* **20**, 3174) that at the max. change per substrate unit the substrate present is c pletely bound to enzyme is not in harmony with exptl. results. Arguments are vanced in support of the application of the law of mass action in the form used by ' chaelis, Euler, Willstatter, Kuhn and the author. A. W. Do

Enzymic cleavage of dipeptides. II. HANS V. EULER AND KARL JOSEPHS *Z. physiol. Chem* **157**, 122–39(1926); cf. *C. A* **20**, 1419.—The cleavage of dipepti (glycylglycine) by animal erepsin is inhibited by glycine and by alanine, from wh the inference is drawn that the binding of substrate to enzyme is by means of the NH_2 groups of the substrate. This view is further substantiated by the influenc substituents in the glycine mol. Substitution of Bz or Ac on the amino, *e. g.*, hipp and aceturic acids, destroys the inhibitory power, whereas esterification of the CO does not There is no good reason for assuming that ereptic action is limited absolut to di- and tripeptides. It may be a matter of relative rather than abs specific the affinity of the peptide for the enzyme diminishing progressively with increa length of the peptide chain. Glycine anhydride, although not hydrolyzed by erep inhibits the cleavage of glycylglycine. Urea is without influence. Benzoylgly glycine is not hydrolyzed by erepsin nor does it inhibit ereptic cleavage of glycylgly Curtius' biuret base (triglycylglycine Et ester) is hydrolyzed by erepsin, showing th free NH_2 group but not a COOH group is necessary for ereptic cleavage. A. W D

Theories of symplasma and ultra-visable organisms (Herelle phenomenon). FALCK. *Pharm. Ztg.* **71**, 1155-7(1927).—A discussion of symplasma and the teriophage. W. O

Surgical problems in the realm of physical chemistry. IMMO WYMER *med. Wochschr.* **52**, 1416-9(1926).—A review of the applications of physico-c principles to surgical problems. ARTHUR GROLLM

Comparative study of turacin and hematin and its bearing on cytochrome. KEILIN. *Proc. Roy. Soc.* (London) **100B**, 129–51(1926).—Turacin, a Cu-porph compd. occurring in feathers, differs from Fe-porphyrin compds. in that it does combine with compds. of N as NH_3, pyridine, nicotine and albumin, does not s oxidation or reduction effect and does not yield a peroxidase reaction. The de of dispersion of turacin governs its absorption spectrum, the bands shifting tow the long-wave end of the spectrum as the degree of dispersion decreases. Acid hem prepd. from hemoglobin, is a colloidal suspension of hematin, not combined with gl but protected by the globin from pptn. Alk. hematin, prepd. from hemoglob from hemin crystals, is the same compd., an Fe deriv. of porphyrin devoid of pr On oxidation, alk. globin-hemochromogen is dissocd into globin and hematin comp on reduction, the hematin combines with globin to form hemochromogen. At neutral point and within a limited p_H range, hematin combines with compds to produce parahematin compds. such as kathemoglobin. The compds. of hem and hemochromogen with NH_3 and pyridine yield spectra with absorption b which shift toward the short-wave end of the spectrum as the degree of disp increases. In these derivs. of hemochromogen, as the degree of aggregation incr the shift of the α band toward the red end may reach 170 A. U. for the NH_3 co and 140° A. U. for the pyridine compd. When such a hemochromogen is present, p in soln. and partly in fine suspension, a characteristic absorption spectrum w bands results; the 2 α bands have a geminated appearance. When hemochromo contg. globin, pyridine, nicotine and other compds. of N are oxidized with K_3Fe then reduced with $Na_2S_2O_4$, the products have 4-banded absorption spectra resemb

that of cytochrome. Oxidized cytochrome has all the properties of a parahematin compd. Reduced cytochrome apparently is a deriv. of hemoglobin, present in 2 distinct degrees of dispersion, and partly modified by oxidation and reduction.

JOSEPH S. HEPBURN

Equations applicable to simple hemolytic reactions. ERIC PONDER. *Proc. Roy. Soc.* (London) **100B**, 199–222(1926).—In simple hemolytic systems, 3 principal factors are involved: (1) the velocity of the reaction between the lysin and the cell component which is acted upon, (2) the distribution of the resistances of the cells in the suspension, and (3) the fact that the reaction occurs only in the region of the surfaces of the cells and not continuously throughout the system. The fundamental reaction between cells and lysin is of the first order. The zone of action about each cell extends approx. 6μ from the cell surface in all directions. The idea that simple hemolysins act by virtue of a solvent action on the erythrocyte membrane is untenable. A chem. reaction is involved and is accompanied by subsidiary reactions in which the liberated contents of the less resistant cells play an important part. JOSEPH S. HEPBURN

Isolation of some hitherto undescribed products of hydrolysis of proteins. III. S. B. SCHRYVER AND H. W. BUSTON. *Proc. Roy. Soc.* (London) **100B**, 360–7(1926); cf. *C. A.* **20**, 2683.—An hitherto unknown base, *protoctin*, $C_8H_{15}O_5N_3$, readily sol. in abs alc., has been isolated from the products of hydrolysis of the proteins of oats and castor beans. It contains 1 NH_2 group, 1 OH group, 1 COOH group, and no alkyl groups; the other 2 N atoms apparently are present in a basic group similar to the iminazole ring. Protoctin has an acid dissocn. const. 1.8 $\times$ 10^{-12}; basic dissocn. consts. could not be deduced from the curve of the electrometric titration. The base and most of its salts are readily sol. in water; it forms a $(C_6H_5CO)_2$ deriv. m. 109°, a $CONC_6H_5$ deriv. m 130°, and a phenylhydantoin deriv. m. 148°, and is distinguished from histidine by certain color reactions: In alk. soln. it gives an orange red color with diazobenzenesulfonic acid; this color changes to orange yellow with acids. On reduction with Zn dust and addn of NH_3, a light brown color develops; this changes to a very faint pinkish brown color on addn. of H_2O_2. Br water produces a flocculent yellow ppt which settles rapidly as a sticky mass and is destroyed on warming, the soln. becoming colorless JOSEPH S. HEPBURN

The function of a phosphatase in bone-formation. H. D. KAY. *Brit. J. Exptl. Path* **7**, 177–80(1926) —Normal blood plasma contains a small quantity of an acid-sol. phosphoric ester which is hydrolyzable by bone phosphatase. This may be an important factor in bone-formation and maintenance. The phosphatase content of the whole bone is extremely high in fetal life, but diminishes as the rate of bone-formation decreases In the kidney, on the other hand, the phosphatase is lowest in the fetal stage, and rapidly increases as the kidney becomes functional. HARRIET F. HOLMES

Adipocere and its origin. GIUSEPPE BIANCHINI. *Biochim. terap. sper.* **12**, 16–39 (1926).—Aseptic autolysis of muscle fat leads to a slow degradation and complete destruction. Putrefaction, especially in presence of water, decomposes muscle proteins rapidly, producing fatty acids of low mol. wt., the Ca and Mg salts of which are the main constituents of adipocere. These acids of protein origin may be synthesized to highe fatty acids by the action of molds or liver enzymes. The fat extd. from cadave muscles is mostly fat of infiltration. MARY JACOBSEN

Zinc ion and glucolysis in blood. L. J. VIVIANI. *Rev. facultad cien. quim.* **4** 31–72(1926).—The extraordinary promoting effect of Zn on the growth of *Aspergillu niger* led to the expectation of an activating effect on blood glucolysis, in view of th coincidence of these properties in Fe and Mn. The normal glucolysis amts. to 20–40% when the blood of dogs is incubated for 1 hr. at 39°. It is not materially affected by 10^{-} to 10^{-6} mg. Zn/cc. and is completely abolished by 2 mg. Zn/cc. blood. The inhibitor effect is due entirely to the Zn ion, SO_4 and p_H being immaterial. Of the metho tested by means of aq. glucose solns. of known content that of Lehmann in Bout Fleury's modification was found to be the most satisfactory. It gives the lowes relative error (4.5%) for a soln. corresponding to a hypoglucemia of 0.05%, ensur complete removal of reducing substances and rapid detn. Exact figures for sug solns. corresponding to iso- and hyperglucemic blood were also obtained with the method of Folin-Wu and of Lewis and Benedict, not with that of Thivolle-Fontes. M. J.

The precipitation of calcium and magnesium from sea-water. L. IRVING. *Marine Biol. Assoc.* **14**, 441–5(1926).—Graded amts. of NaOH and Na_2CO_3, resp. were added to samples of sea-water; curves show the relation of percent Ca and M pptd. and p_H against NaOH and Na_2CO_3 added. With either of the latter Ca exceed Mg in the ppt. $MgCO_3$ ppts. much more Ca and relatively little Mg up to p_H 10 A small amt. of Mg is pptd. by Na_2CO_3. These facts agree with the much great

soly. product of $MgCO_3$. NaOH ppts. increasingly less Ca above p_H 10, conforming with the greater soly. of $Ca(OH)_2$ than of $CaCO_3$. Ca and some Mg may be pptd. under possible conditions of natural sea-water alky., although it is another question as to how frequently this alky. is attained The same conditions governing pptn. outside of the organism may explain the excess of Ca over Mg in organic "formed" ppts., as alky. necessary for Mg pptn. is much more difficult for the organism to attain, especially within its tissues. N. KOPELOFF

The biochemical racial-index of the Japanese in the Hokurika district (northern part of middle Japan). T. FURUHATA AND K. TAKAYOSHI. *Japan Med. World* **6,** 1-3(1926).—Following Hirschfeld's finding that there is a remarkable difference in blood grouping in different races F. and T., using the "biochemical racial-index," (A + AB)/(B + AB) or (II + IV)/(III + IV), conclude that in Japan the largest index is in Kyushi and the smallest in the Hokurika district gradually decreasing from South to North. "This fact may have some meaning if we remember that the ancestors of the Japanese established themselves first in Kyushi and gradually spread eastward." N. KOPELOFF

Catalase and its relation to biological oxidations. II. S. HENNICHS. *Biochem Z.* **171,** 314-71(1926); cf. *C. A.* **19,** 84.—In order to obtain active catalase it was prepd. from horse liver by several methods. Extns. with H_2O at various acidities and temps., with toluene and H_2O, and pptn with adsorbents such as $Al(OH)_3$ and kaolin were tried. The most active prepn. contained 4 12% Fe but no relation was found between the amt of Fe present and catalase activity. The activity was destroyed by HCl, and by dialysis and was not recovered in the presence of $FeCl_3$. Retardation of the activity by HCN was only roughly proportional to the activity or degree of purity of the enzyme. Therefore the active group in catalase may not be Fe W. D L.

Fractionation of serum proteins. I. Electrodialysis. G. ETTISCH AND W. BECK. *Biochem. Z* **171,** 443 53(1926).—During the electrodialysis of serum proteins the p_H of the soln. increases to a max. value, until the cond. becomes quite low, when the p_H decreases again In general proteins sep. from soln as the electrolytes are removed. When the p_H is below 7.0, much globulin ppts. **II. Theory of electrodialysis.** *Ibid* 454-66. W. D L.

Phosphatase and the preparation of acid esters of pyrophosphoric acid. C. NEUBERG AND J. WAGNER. *Biochem. Z.* **171,** 485-500(1926).—By the reaction of $POCl_3$ upon phenol in pyridine soln. is obtained *diphenyl pyrophosphate*. The ester is readily hydrolyzed by phosphatase. Similarly, the orthophosphate, $(C_6H_5)_2KPO_4$, prepd. from the pyrophosphate is also readily hydrolyzed by phosphatase or by ext. of horse kidney. W. D L

The recrystallization of urease. J B. SUMNER *J Biol. Chem.* **70,** 97-8(1926). cf. *C. A.* **20,** 3301.—Urease may be recrytd. by pptn. from aq. soln. with Me_2CO provided a small amt. of a buffer soln. of p_H 6 1 or 6.3 is added to the H_2O-Me_2CO mixt. This recrystd. urease has the same activity as the once crystd. urease, the best evidence that the octahedral crystals obtained are indeed identical with urease. Two recrystns. resulted in a loss of about 80% of the enzyme taken at the start. In prepg urease crystals from jack-bean meal, extn. with 31.6% Me_2CO at about 28° should be employed as the cryst. ppt. is then not contaminated with an appreciable amt of insol. material (canavalin or some unknown jack-bean protein); this contamination occurs when the extn. is done at 0°. A. P. LOTHROP

The specific gravity of protoplasm. I. HANS LEONTIEV *Biochem. Z.* **170,** 326 9(1926).—The sp. gr. is detd. by the method of a "falling ball," with Stokes' formula: $V = 2/g \times [r^2(D - d)g]/y$, where V is the velocity in cm./sec.; g the rate of acceleration by gravity; r the radius of the ball; D the density of the ball; y the viscosity of the medium and d the density of the medium. Amebas being regarded as small protoplasmic balls, the av. velocity of fall of organisms of 8μ radius at 15.0-15.7° was 5.71μ per sec. From this the value of D of the ameba is calcd. as 1.043. S. M.

Fractionation of the serum proteins. III. Acid precipitation. G. ETTISCH AND W. BECK. *Biochem. Z.* **172,** 1-9(1926).—The electrolytes of the serum play a significant part in the pptn. of proteins with acid. In the presence of a normal electrolyte content the pptn. with acid is impossible, the quantity of protein pptg. out being greater the more nearly free from electrolyte is the serum. Furthermore, in the process of protein pptn. the chem. structure of the protoplasm is destroyed and can no longer be restored. Thus, it is impossible to dissolve a quantity of globulin present in serum, even when the same electrolyte concn. with the same p_H is used. S. MORGULIS

The effect of the ethyl ester of hydrocyanic acid (ethyl carbylamine) on the catalysis by heavy metals. SHIGERU TODA. *Biochem. Z.* **172,** 17-30(1926).—EtN=C, as well

as its isomer propionitrile, and valeronitrile, were used in a series of expts. on the rate of oxidation of cysteine, leucine and fructose. Carbylamine in 10^{-3} N concn. inhibits completely the oxidation of cysteine and in 10^{-4} N causes 35% inhibition. The addn. of $FeSO_4$ to produce a concn. of Fe 0.4×10^{-5} N causes a great increase in the oxidation rate not only in mixts. free from carbylamine but also where this substance was in concn. of 10^{-4} N, but with the stronger concn., 10^{-3} N, only 82% of the catalytic effect of the added Fe was developed. $CuSO_4$ also acted catalytically on the cysteine oxidation but very much less effectively than the Fe. Valeronitrile, on the contrary, even in a 10^{-1} N concn., did not inhibit the oxidation. The oxidation of fructose in phosphate soln. is greatly inhibited by EtN = C, both 10^{-3} and 10^{-4} N producing the same effect. The oxidation of leucine on hemin charcoal is likewise inhibited by the carbylamine, the inhibition varying with its concn. in the mixt., and this applies equally to the other nitrile compds., the propionitrile and valeronitrile. The relative toxicities of ethylcarbylamine and of HCN were detd. by subcutaneous injections into rats. The max. ineffective dose of HCN was 0.5 cc. of 10^{-2} N soln., while for $C_2H_5N = C$ it was 0.5 cc. of 10^{-1} N soln., thus showing that the former is about 10 times as toxic as the carbylamine. Carbylamine in the same concns. as used before (10^{-3}–10^{-4} N) does not inhibit the catalase activity of liver tissue. S. MORGULIS

The utilization of cellulose in the animal digestive tract under the influence of oral administration of cellulose-splitting enzyme preparation. N. MESSERLE. *Biochem. Z.* **172,** 31–3(1926).—The livers of various snails contain an enzyme, the lichenase, which converts cellulose to sugar. A prepn. of this enzyme was mixed with the food of a number of mice. The exptl. period was divided into 3 sections: (1) without addn. of enzyme; (2) with the addn. of the active enzyme, and (3) with the addn. of a heat-inactivated enzyme. Judging by the curve of body wt. the utilization of cellulose material was increased under the influence of the active lichenase. S. MORGULIS

Citrylhemin. HELENE GOLDMAN. *Biochem. Z.* **172,** 127–32(1926).—Citrylhemin has been prepd. from blood by Partos' method. The yield was 0.4–0.7 g. per l. of blood The crystals are needle-shaped and readily recognized under the microscope. Their color varies from dark brown to jet black. The m. p. is not sharp; decompn. occurs at about 250°. The crystals are insol. in H_2O, concd. HCl, ether, EtOH, $CHCl_3$; slightly sol. in concd. AcOH, cond. H_2SO_4, citric acid soln. of MeOH, concd. NaOH and KOH, and in pyridine; it is somewhat more sol. in MeOH; and readily sol. in 3% KOH or NaOH. The specific extinction coeff. was detd. on 0.013–0.0196% solns. in 3% NaOH by means of a König spectrophotometer, and this showed a striking parallelism to the values obtained for formylhemin; the coeff. increases to a max. at about 600$\mu\mu$; it diminishes between 570 and 540 $\mu\mu$, then rises again to a max. at 520 $\mu\mu$. The elementary compn. detd. on doubly recrystd. material yields 64.65% C; 5.36% H, 8.40% N and 8.85% Fe. This compn. corresponds with the assumption that 1 mol citric acid is combined with 4 hemin mols. to form methylcitrylhydroxyhemin: $C_{34}H_{31}(CH_3)O_4N_4FeOOC(C_{34}H_{31}(CH_3)O_4N_4FeO)C(CH_2COOFeN_4O_4C_{34}H_{31}(CH_3))_2$.
S MORGULIS

Diastase adsorption. ZERLINE UNNA. *Biochem. Z.* **172,** 392–410(1926).—The adsorption of diastase in pancreatic exts. by animal charcoal has been studied. The adsorption is irreversible and increases with temp. The adsorption curves at 0° and at room temp. rise very abruptly to a max. and gradually diminish from that point. The adsorption curve at 37° likewise rises very abruptly but it remains fairly const at that level afterwards. At room temp. the largest amt. of diastase is adsorbed in an hr., at 0° in about $2^1/_2$ hrs. When the adsorption of diastase and of the various admixts. of the ext. as represented by the total amt. of dry residue are compared it is found that these 2 curves intersect. Substances which lower surface tension do not affect the adsorption. The diastase adsorbed to charcoal has but a slight effect on starch while it is entirely ineffective with glycogen solns. S. MORGULIS

The separation of the enzymes of malt extract. II. Lichenase and cellobiase. HANS PRINGSHEIM AND ARTHUR BEISER. *Biochem. Z.* **172,** 411–21(1926); cf. *C. A.* **20,** 1924.—Lichenase and cellobiase have been sepd. in the barley malt ext. by means of fractional adsorption with $Al(OH)_3$. At $p_H = 11$ practically $^2/_3$ of the cellobiase is adsorbed with very little admixt. of the lichenase; the rest is removed by a second adsorption at $p_H = 3$, but in this a considerable amt. of the lichenase is removed, too.
S. MORGULIS

The ammonia content and ammonia formation in blood. V. The ammonia content of normal human blood. A. KLISIECKI. *Biochem. Z.* **172,** 442–6(1926).—The venous blood from 44 healthy young men was analyzed, immediately after its withdrawal, for NH_3 by the method of Parnas and Heller. The NH_3 content according

to these detns. was on the av. 0.026 mg. NH_3 N per 100 cc. blood (extreme variations of 0.011 to 0.075 mg. %). S. MORGULIS

Liesegang's rings in blood agar plates. IKUTARO TAKAGI. *Biochem. Z.* **172,** 483–8(1926).—When colloidal Hg is added to blood agar plates very distinct Liesegang's rings appear. Metallic Hg acts oligodynamically on blood agar plates S. M.

Glycerophosphatase. HIDEO KOBAYASHI. *J. Biochem.* (Japan) **6,** 261–74(1926).—The optimum acidity for the activity of glycerophosphatase is at p_H 5.56. The rate of hydrolysis of glycerophosphate is proportional to the enzyme quantity, *i. e.*, the time necessary for equal degrees of hydrolysis is inversely proportional to the amt. of enzyme. The affinity between the enzyme and the substrate is not influenced by the acidity of the medium. S. MORGULIS

Adsorption of pepsin. KOICHI KIKAWA. *J. Biochem.* (Japan) **6,** 275–86(1926).—Pepsin is best adsorbed on animal charcoal at p_H 1 or 2. The adsorbed pepsin can be leached out from the coal by a phosphate soln. of p_H 6.8 or a citrate soln. of p_H 5, but not by a citrate-HCl mixt. of p_H 1.8. The coal with the adsorbed pepsin can digest casein at p_H 1.8, but under these conditions much of the pepsin is leached out; in all probability the latter exerts the digestive action. The leaching out effect of protein is not due either to the lowering of surface tension or to its viscosity. Amino acids, peptone and diketopiperazine do not have the same property as the protein mol. It is suggested that the leaching out of the pepsin by protein may be due to the affinity of one for the other. S. MORGULIS

Gallodesoxycholic acid from the bile of chickens and its influence on pancreas lipase activity. SADATOMO YONEMURA. *J. Biochem.* (Japan) **6,** 287–96(1926).—Fresh bile was obtained from bile fistulas in chickens. About 400 g. was boiled under a reflux over the water bath with 40 g. KOH, acidified with dil. HCl and the substance pptd. as a dark, sticky mass. This raw bile acid was then purified by first repeatedly kneading in cold water, dissolving in 200 cc. alc. and removing the fatty acids by several extns. with petroleum ether. After evapn. the residue was once more taken up in 100 cc. alc. and boiled for 2 hrs. under a reflux with 100 cc. 2% Na. After concn. to a vol. of 20 cc. the soln. was acidified with dil. H_2SO_4, again extd. with petroleum ether, and evapd. The treatment with Na-alc. was repeated, and finally the soln. of the purified residue was digested with 10% $Ba(OH)_2$. The Ba salt of the gallodesoxycholic acid was then recrystd. from alc. The pure acid prepd. from this salt is a snow white powder, insol. in H_2O, petr. ether or benzene, but sol. in alc., acetone, glacial AcOH and ether. It crystallizes with great difficulty. Dissolved in acetic anhydride it gives with concd. H_2SO_4 a beautiful play of colors. Its sp. rotation in alc. is $[\alpha]^{21}_D = 13.23°$. The crystals become soft at 95° and m. 112°. Its Ba salt has the compn. $C_{48}H_{78}O_8Ba$. Gallodehydrodesoxycholic acid was prepd. from a soln. in glacial AcOH by boiling with CrO_3. The substance was obtained as shiny crystals, insol. in H_2O, petr. ether or benzene, and m. 153–4°; its compn. is $C_{24}H_{66}O_4$. Gallodesoxybilianic acid was likewise prepd. by boiling with concd. HNO_3. The resulting substance, which is now crystd. from a MeOH soln., is identified by its crystal form and m. p. 89–90° as a trimethyl ester of desoxybilianic acid. The gallodesoxycholic acid increases the activity of pancreatic lipase as well as cholic acid does. S. MORGULIS

Alteration of liver arginase activity through external factors. SABURO HINO. *J. Biochem.* (Japan) **6,** 335–66(1926).—A low temp. of 4° to 8° does not diminish the activity of a soln. of liver arginase even after 10 days. The destructive effect of higher temp. varies according to the H-ion concn. At a p_H of 6.8 heating for 1 hr. at 60° causes a loss of 36.1% of activity; at 70°, 80.1%; at 75° almost complete; and at 80° complete destruction. At a p_H of 7.34 heating for 1 hr. at 50° produces a destruction of 32%; at 60°, 67%; and at 70° it is completely destroyed in 1/2 hr. The presence of phosphates does not make the liver arginase thermolabile. No anti-arginase effect of serum can be demonstrated with arginase prepns., as has been shown in the case of other enzymes. NaF has an inhibitory influence on arginase: 42 mg. causes 55.3% inhibition; 4.2 mg. 23.7% inhibition and 0.84 mg. exerts a weak inhibitory effect. Min. quantities, 0.084 mg., which are no longer inhibitory do not produce a stimulation of the enzymic action. The inhibitory influence of the NaF is regular, and is a linear function of the log. of its concn. KBr is without any effect, although this substance had been tested within a wide range of concn. (119 mg. to 0.119 mg.), and this is equally true for KCN and KI. Free I_2, however, even in the small amt. of 0.635 mg. was found to exert inhibition and double that amt. to produce a strong destructive action on the enzyme. Subsequent treatment with $Na_2S_2O_4$ does not cause the regeneration of the enzyme. Quinine either at p_H 7.3 or p_H 7.95 has no stimulating effect upon arginase even in as large a dose as 10 mg.; atoxyl does not destroy the argi-

ase although the effect of this substance has been studied with 100 mg. doses. The opt. activity of arginase was found at p_H 7.4, the hydrolysis of a known arginine Cl soln. naving been measured by means of the formol titration. S. MORGULIS

The effect of quinine and of some hormone preparations on the phosphoric acid hydrolysis during autolysis of muscle and liver. YASUSADA ODA. *J. Biochem.* (Japan) 5, 367–82(1926).—Insulin, pituitrin and adrenaline, nor quinine in the concns. used, have had any effect upon the rate of phosphoric acid hydrolysis in the autolyzing muscle or liver tissue. S MORGULIS

Adsorption phenomena. EFFRONT. *Petit j. brasseur* **34**, 121–3(1926); *Chimie et industrie* **16**, 34(1926).—The adsorbing power of a few filter papers and of some vegetable pulps on *diastases* or *antidiastases* were studied. No. 331 Drevenhofer paper showed very high adsorptive power, complete adsorption being obtained under certain conditions. With pepsin, the adsorption increases with the temp. to which the pepsin was heated. On the other hand, the liquefying power of the diastases of certain vegetables, which is decreased by heating, is raised by filtration, sometimes to a value greater than it was before heating. These facts can explain certain phenomena in the normal or pathological life of cells. A. PAPINEAU-COUTURE

General view of the function of catalysis in enzyme reactions. HANS VON EULER. *2ième Cons. Chim. Inst. Intern. Chim. Solvay* **1926**, 656–67.—A review with bibliography of 24 references. A. PAPINEAU-COUTURE

Chemical and physiological properties of the endocrine principles; their application in the assay of organotherapeutic products. R. FABRE. *J. pharm. chim.* [8] **4**, 13–27, 77–84, 114–22, 168–85(1926).—A lecture, giving a detailed review of the characters and physiol effects of internal secretions S. WALDBOTT

Some studies on taste and chemical constitution. T. C. JALESKI. *J. Am. Pharm. Assoc.* **15**, 461–3(1926).—Chiefly a compilation and discussion. L. E. WARREN

Chemical nature of substances required for cell multiplication. ALEXIS CARREL AND LILLIAN E. BAKER. *J. Exptl. Med.* **44**, 503–21(1926) —Fibroblasts and epithelial cells in pure culture obtain the N, which they build into protoplasm, from proteoses and possibly other primary derivs. of proteins. These proteoses have been prepd. from embryo tissues, egg white, com. fibrin, rabbit brain, etc. The presence in embryo juice of a hormone that stimulates cell division is improbable. Proteoses sepd. from peptic digests of fibrin by Na_2SO_4 det. a more abundant and prolonged multiplication of the fibroblasts than is produced by embryo juice. Peptones and the smaller split products appear to furnish some nutrient material but do not cause the rapid proliferation characteristic of proteoses and are sometimes toxic for tissue cells. Possibly the effect of embryo juice on fibroblasts and epithelium is due to the splitting of the protein of the juice into proteoses by the cell enzyme, or by other enzymes activated by the presence of living cells. C. J. WEST

Adsorption in its relation to catalysis and enzyme actions (DUCLAUX) **2**. The physical behavior of amino acids, polypeptides, 2,5-diketopiperazines and proteins (ABDERHALDEN, HAAS) **10**. Electrolytic concentration of protein solutions (REITSTÖTTER, LASCH)**2**.

B—METHODS AND APPARATUS

STANLEY R. BENEDICT

Microelectrodes and micromagnets. C. V. TAYLOR. *Proc. Soc. Exptl. Biol. Med.* **23**, 147–50(1925).—Details are given for the construction of microelectrodes and [magn]ets, to be used with a micromanipulator in the study of the elec. and mag[netic prop]erties of protoplasm in the interior of a living cell. Pt or Fe wire inserted [in a close]-fitting quartz capillary tube can be drawn over a minute oxy-acetylene flame [to a perfe]ctly insulated point less than 1 micron in diameter. A non-polarizable elec[trode] is described. C. V. B.

[...] **reactions for sugar.** C. VAN BEMMEL. *Nederland. Tijdschr. Geneeskunde* [...] 1926).—After examg. more than 100 samples of urine, B. has found 5 samples [whic]h gave a blackish brown ppt. with Nylander's reagent. This ppt. disappeared [on heat]ing the test tube for a short time; the reaction with Fehling soln. was negative [in thes]e cases. No drugs had been taken previously by the patients. R. B.

[P]urification of enzymes by electrodialysis and electro-osmose. R. FRICKE, [...]HER AND H. BORCHERS. *Kolloid-Z.* **39**, 152–65(1926).—The app. for electro[...] [co]nsisted of an earthenware box which was composed of end plates and middle [sections]. The middle sections were of different widths but each section was complete [and] contained a bottom and both sides. The length of the box depended on the

no. and width of the middle sections used. Membranes were fitted between the middle sections and the whole was held together by bolts. The membranes were made by pouring AcOH-collodion solns. on glass plates and drying for a day or more. The collodion content was from 12% to 22%. The more *concd. collodion solns.* were made by drying and pulverizing the collodion and dissolving in a mixt. of 160 vols. AcOH, 15 vols. EtOH and 10 vols. of Ac_2O, all carefully dried and purified. To prevent the middle cell becoming acid an anodic diaphragm of chrome gelatin was tried but it had a poisonous effect on the trypsin. The voltages used were between 70 and 200 v. and the c. ds. were between 0.275 and 1.2 milliamp. per cm^2. A short electrodialysis improved the activity of trypsin but long-continued electrodialysis caused complete inactivity. A table shows the changes with time, in dry wt., ash content, N content and activity. Similar data were obtained for invertin in a like manner. For invertin, the anode membrane was chrome-gelatin, prepd. by smearing a wool cloth with a soln. of 10 g. of gelatin, 3 g. of $(NH_4)_2Cr_2O_7$, and 5 g. of glycerol in 100 cc. of distd. H_2O. After exposure to light the smearing was repeated a 2nd or 3rd time. Tables show the change, with duration of electrodialysis, of vol. of soln., % of dry wt., ash content, time value, and inversion capacity. Up to 125 hrs., the end of the expt., the activity of the invertin increased. A large no. of references is given. F. E. Brown

A vacuum extractor for biochemical use. N. B. Guerrant. *Ind. Eng. Chem.* **18,** 1090(1926). E. J. C.

The occurrence and identification of copratin and copratoporphyrin. IV. O. Schumm and E. Mertens. *Z. physiol. Chem.* **156,** 61-7(1926).—Slight bleeding in the region of the digestive tract, *e. g.*, in carcinoma of the stomach, is some times indicated by a positive copratin test in the feces Copratin is usually accompanied in such cases by its deriv. copratoporphyrin, and hematin and the other porphyrins may be absent. A negative pyridine-hemochromogen test is therefore not necessarily conclusive, but should be supplemented by a test for copratin and copratoporphyrin Spectroscopic examn. after removal of the $CHCl_3$-sol porphyrin easily distinguishes copratoporphyrin from coproporphyrin and hemateric acid. A. W. Dox

The tryptophan-aldehyde reaction. III. The tryptophan reaction with formaldehyde and with *p*-dimethylaminobenzaldehyde. Ernst Komm. *Z. physiol. Chem.* **156,** 35-60(1926)—For colorimetric detn. of tryptophan by the aldehyde reaction, *p*-$Me_2NC_6H_4CHO$ is preferable to CH_2O. Both reagents are sp. for the tryptophan component of proteins. The $Me_2NC_6H_4CHO$ reaction is less sensitive (1:125,000) than the CH_2O reaction, but it is more suitable for colorimetric comparisons because the resulting color is uniformly blue even at great diln., while the color obtained with CH_2O varies from blue to reddish violet according to the concn. of reagent. In both reactions the color intensity is strictly proportional to the amt of tryptophan present. The influence of oxidizing and reducing agents is the same in both cases A very small amt. of oxidizing agent hastens the reaction but soon causes the color to fade; larger amts interfere with the development of max. color or even bleach out the color once formed Strong reducing agents also interfere. The influence of protein and amino acids is the same in both cases. Only proline and its derivs. intensify the color reaction as do also many proteins, especially gelatin. Free tryptophan requires 5 days for the max. development of color, whereas tryptophan in proteins or in the presence of tryptophan-free proteins (gelatin) reacts more rapidly. Exposure to sunlight has no effect. **IV. Investigations on the influence of proline and proteins on the reaction.** *Ibid* 161-201.—The tryptophan-aldehyde reaction is promoted by pyrrole derivs. in proportion to the amt. of pyrrole nucleus present. With 0.6 mg. of tryptophan the min. amt. of proline required to give the promoter effect is 4.5 mg, corresponding to 2.6 mg. pyrrole nucleus. The effect of hydrolyzed gelatin is observed with 17 mg. This would correspond to 26% of proline and hydroxyproline which is in close agreement with Dakin's yield of 24% by hydrolysis of gelatin. Unhydrolyzed gelatin, on the other hand, shows the promoter effect at 3.5 mg, corresponding to a pyrrole content of 74%. Assuming that the pyrrole derivs. are sp. in this effect, the tryptophan-aldehyde reaction offers a *method for detg. proline and hydroxyproline in hydrolytic products, and total pyrrole* as complexes in the protein mol. On the basis of this reaction the amt. of proline and hydroxyproline in the hydrolysates from other proteins, after destruction of their own tryptophan, was: casein 8.3%, keratin 22%, ovalbumin 13.2%, blood albumin 17%. Direct detn. of total pyrrole in native proteins by this method is thus far not practicable except in the case of gelatin where no tryptophan complex is present. **V. Method for the determination of tryptophan and the tryptophan content of some proteins.** *Ibid* 202-17.—With pure tryptophan the aldehyde reaction does not reach its max. intensity until about 5 days. This is

true also of certain proteins, *e. g.*, serum albumin, due probably to a deficiency of proline or pyrrole complexes. For detn by color comparison it is essential that the max. intensities be compared. These can be obtained by the addn of gelatin, thus shortening the time of max. color development to 10 min. For the sake of uniformity gelatin is added in every case The detn. is performed as follows: Dissolve or suspend a weighed amt of the substance (*e g*, 0.02 g) in 2 cc. H_2O and add 2 cc of a soln. of 0 25% *p*-$Me_2NC_6H_4CHO$ or 0 375% CH_2O in 10% HCl. Add 1 cc of 5% gelatin and 5 cc 10% HCl. Allow 10 cc. concd H_2SO_4 to flow to the bottom of the soln and shake carefully until mixed. This treatment dissolves difficultly sol proteins After 15 20 min compare in the colorimeter with a standard prepd in the same manner from pure tryptophan (*e g*, 0.0007 g.). The amt of sample should be so chosen that the color intensity will approximate that of the standard. This can be ascertained by a preliminary test Detns of tryptophan in various proteins by this method agree closely with detns made by other investigators using different methods A. W D

The determination of arginine and histidine. A. Kossel and W. Staudt *Z physiol Chem.* **156,** 270-4(1926) -- The pptn of arginine by flavianic acid (1-naphthol-2,4-dinitro-7-sulfonic acid) is quant. at acidities between the turning point of litmus and 0.1 *N* H_2SO_4 The presence of an equal amt. of histidine does not interfere For detn. in protamine or protein hydrolysates the difference between the sum of the arginine and histidine as shown by the N content of the $AgNO_3$-$Ba(OH)_2$ ppt. and the arginine detd directly as flavianate represents histidine. A. W Dox

What value does the Walter method for bromine give? K Walter. *Deut med Wochschr* **52,** 1126 7(1926).- -An answer to the objections of Bieling and Weichbrodt, *C A* **20,** 2865 The results of these workers are attributed to an impurity in their HNO_3 Arthur Grollman

A new type of oxygen chamber. A. L Barach *J. Clin. Investigation* **2,** 463-76 (1926) -A new type of O chamber is described in which there is adequate removal of CO_2, moisture and heat The CO_2 is removed by contact with soda lime; the moisture is condensed on Al pipes through which cold H_2O is circulated; and the air is warmed by the body heat of the patient The chamber is transportable and its operation is simple Its maintenance cost is 6 to 8 dollars per day. Arthur Grollman

The determination of antimony in biological material. E. Scheller. *Arb Reichsgesundh* **57,** 265-70(1926) - -After the destruction of org. material Sb is pptd and weighed as Sb_2S_3 according to Vortmann-Metzl and Henz. For min. quantities 0 07 0 005 mg the SbH_3 stain on $HgCl_2$ is used (Sanger-Riegel). When given to dogs as pentavalent Sb (metantimoniate in tartaric acid) 0 046 g. Sb/kg. was well tolerated, while an admixt of only 1% tervalent Sb caused vomiting. Mary Jacobsen

Determination of porphyrin in urine. Victor Froboese. *Arb. Reichsgesundh* **57,** 658-80(1926); cf *C A* **18,** 2346, 3397.—Of all the methods recommended the following modification of Fischer and Zerweck's procedure gives correct results: Make 1 l urine faintly acid with AcOH, add 3 cc. glacial AcOH and 1 l. ether, shake 25 times and repeat this operation 3 times. Shake the ether out with 9 20-cc. portions of water, and after complete sepn from the latter 3 times with 4, 3, and 3 cc., resp , of 25% HCl Compare the HCl ext. (stock soln.) spectrophotometrically with a standard soln contg 0.0008 mg. porphyrin-HCl/cc. The absorption band in green 550 is just visible with a 3-cm layer of this soln. = 0.0024 mg. If x be the mg./cc. in an unknown soln , V the final diln and D the thickness of the layer in the spectroscope then: $x/V = 0.0024/D$. A modification of the Garrod method, which consists in centrifuging the phosphate ppt and dissolving it immediately in HCl, yields a porphyrin soln. almost free from other pigments and nearly correct results. Fresh urine or one preserved by addn. of 100 cc. ether/l should be used. HCl commonly recommended as a preservative hastens the disappearance of porphyrins. The porphyrin content of normal urine is 0.11 mg./l. (122 samples examd) The lower limit for pathol. urines is 0.33 mg Neither the color of the urine nor that of the phosphate ppt. is a trustworthy indicator of porphyrinuria. Mary Jacobsen

A new method for quantitative sampling of the sea-bottom. O D. Hunt. *J. Marine Biol. Assoc* **14,** 529-34(1926).—The "Vacuum Grab," a metal chamber hermetically sealed by a glass diaphragm, is lowered to the bottom; there the diaphragm is automatically broken. The pressure of the overlying water column forces into the chamber a sample of the bottom, which is prevented by a "trap" device from escaping when the app is raised. Samples taken by this method enable a quant. gravimetric and volumetric analysis of the constituents. N. Kopeloff

A gas analysis apparatus modified for the determination of methane in metabolism experiments. T. M. Carpenter and E. L. Fox. *J. Biol. Chem.* **70,** 115-21(1926).—

The gas analysis app. devised by C. (*C. A.* **17,** 3685) for the detn. of CO_2 and O_2 in the outgoing air from a respiration chamber has been so modified that the detn. of CH_4 (produced in the alimentary tract in the metabolism of certain types of animals, particularly ruminants) may be accurately made. The gas is slowly burned in a combustion pipet and detd. as CO_2. A. P. LOTHROP

A method for the determination of allantoin in rabbit urine. A. A. CHRISTMAN. *J. Biol. Chem.* **70,** 173-91(1926).--The method described for the detn. of allantoin in rabbit urine is based upon the hydrolysis of allantoin to oxalic acid which is then pptd. as CaC_2O_4 and estd. by $KMnO_4$ titration The method requires about 6–7 hrs. but only half this time is used in actual manipulation; the method is much shorter than the standard one of Wiechowski and is more accurate especially for small quantities of allantoin. A. P. LOTHROP

The colorimetric estimation of cholesterol and lecithin in blood in connection with Folin and Wu's system of blood analysis. G. M DE TONI. *J. Biol. Chem.* **70,** 207–10 (1926).—The protein ppt obtained in the Folin-Wu system of blood analysis is washed, dried and extd with hot $CHCl_3$ in a similar manner to that employed by Myers and Wardell (*C. A.* **12,** 2592) for whole blood Cholesterol is estd in the $CHCl_3$ ext. as usual by the Liebermann reaction and the lecithin is detd as lipoid P by Whitehorn's recent method (*C A* **19,** 663). A. P LOTHROP

A critical evaluation of Hahn's quantitative method for determining protein and proteose. FLORENCE B. SEIBERT *J. Biol Chem.* **70,** 265–72(1926).—"Hahn's method (*C. A.* **16,** 285) with modifications as described is reliable with an exptl. error of no more than 1% for detg the % of whole protein, proteose and residual N. Highly purified and when possible cryst representatives of different protein groups were quant pptd. to within 1–2% by CCl_3CO_2H This finding supports the conclusions of Greenwald and others with blood proteins Impure ovalbumin prepns were shown to contain only approx. 86 and 69%, and a sample of Witte peptone only 47.6% of whole protein by this method. When equal parts of a purified protein and a pure proteose are mixed, CCl_3CO_2H ppts the whole protein quant , but in addn., carries down with the ppt. some of the proteose and residual N, which is then erroneously considered as whole protein. Within this limit the method is accurate In the expt. described 3 85% of the proteose and residual N was included in the whole protein fraction. A considerable error is introduced when a protein soln 10 times as concd. as that recommended (1%) is used, because of occlusion of the decompn products with the whole protein ppt " A. P. LOTHROP

The influence of the ethyl ester of hydrocyanic acid (ethylcarbylamine) on Pasteur's reaction. OTTO WARBURG. *Biochem. Z.* **172,** 432–41(1926). —Ethylcarbylamine has been shown to inhibit catalysis by heavy metals as HCN does The prepn. must, therefore, be first freed of any adsorbed traces of HCN, which cannot be done by fractional distn., but should be carried out according to Toda's procedure By using various rat tissues as well as Jensen sarcoma it was found that 10^{-3} *N* soln of the ester does not depress respiration, whereas free HCN in the same concn completely inhibits the respiration of these tissues. This difference in the influence of ethylcarbylamine and of HCN on tissue oxidation and oxidation in model expts. (Toda) is interpreted in the sense that the respiratory catalyst, Fe, is found in different combinations. This hypothesis is demonstrated by the fact that methemoglobin which reacts with HCN by a change in color from brown to a cherry-red fails to react with the ethylcarbylamine. Likewise the CO_2 assimilation (Blackman's reaction) which is 95% inhibited by a 10^{-3} *N* HCN is not affected by its Et ester, so that the catalyst of this reaction behaves like the respiratory enzyme. Similarly, the anaerobic fermentation is not affected by HCN or by ethylcarbylamine. By "Pasteur's reaction" W. designates the phenomenon which Pasteur regarded as the inhibition of fermentation by respiration. This is in reality the relationship represented by the quotient (Anaerobic fermentation—aerobic fermentation)/respiration (Meyerhof), which shows that fermentation and respiration are paired reactions. Since the ethycarbylamine affects neither the respiration nor the anaerobic fermentation of tissues or cells, while under aerobic conditions the fermentation proceeds just the same as under anaerobic conditions (this effect of the Et ester is reversible and the aerobic fermentation of the tissue drops to its usual low level as soon as it is transferred to an ester-free soln.), the above quotient under the influence of the Et ester becomes 0; *i. e* , the pairing of the respiratory and the fermentative processes is broken. This effect of the ethylcarbylamine is shown to be a sp. chem. reaction and not a case of narcosis, depending upon its ability to form completely with the heavy metal catalyst of the "Pasteur reaction" but not of the respiratory enzyme. S. MORGULIS

A citrylhemin. A. Partos. *Biochem. Z.* **172,** 126(1926).—P. prepd. a cryst. product by treating a blood coagulum with formic acid in MeOH, which had been identified as formylhydroxyhemin. A cryst. substance was also obtained from sheep blood to which Na_2SO_4 was added in an amt. sufficient to make a 1% concn. and which was coagulated by heat. The coagulum was treated with a 4% citric acid soln. in MeOH. The ext. was filtered and warmed on the water bath until it became turbid. On standing the cryst. substance formed which is thought to be a citrylhemin. It is insol. in alc., ether, $CHCl_3$, and concd. acids or alkalies. It dissolves more or less readily in 7.5% alkali. S. Morgulis

Colorimetric method for the determination of chlorides, inorganic sulfates and inorganic phosphates in small amounts of blood. Shun-ichi Yoshimatsu. *Tohoku J. Exptl. Med.* **7,** 553–9(1926).—From 5 to 10 cc. of blood is deproteinized by means of alc., heat and "Dazol." The detns. of these blood constituents are then made on aliquot parts of one and the same deproteinized sample. The SO_4 is detd. by the author's method (cf. *C. A.* **20,** 2515); PO_4 by Sato's method (cf. *C. A.* **12,** 2587), and Cl by the author's modification of Isaacs' method (cf. *C. A.* **16,** 3494). The results obtained by these colorimetric methods are in close agreement with those obtained by the Whitehorn method for chlorides, the Bell-Doisy method for inorg. phosphates and the gravimetric method for sulfates. L. W. Riggs

Precipitation and determination of uric acid by means of cuprous salts. G. Py. *J. pharm. chim.* [8] **3,** 366–73(1926).—The observation of Ducung (cf. Arthaud and Butte, *Compt. rend. soc. biol.* 1889–93; Rangier, *C. A.* **18,** 1309, **19,** 850) that the quantity of Cu pptd. from urine as a uric acid compd. (*A*) is only $^2/_3$ of the total quantity of Cu consumed, holds good only for rapid pptn. When the sol. org. Cu compd. is in prolonged contact with excess of uric acid (*B*), all the Cu will be pptd. in the form of *A;* then the process becomes one of *retarded total* pptn. of Cu. D.'s method is modified as follows: In prepg. the standard Cu soln (*C*), mix before use equal vols. of a soln. of 4.47 g. crystd. $CuSO_4$ in 1 l. and a soln of 45 g. $Na_2S_2O_3$ and 45 g. $NaKC_4H_4O_6$ in 1 l. To prep. the standard uric acid soln. (*D*), dissolve 0.10 g. of *B* in 50 cc. H_2O, boil with 0.25 g. powd. Na_2CO_3 till clear, and dil. to 100 cc. In 100 cc. of urine dissolve 2 g. (or more) of powd. Na_2CO_3 (contg. 5–7% H_2O), add 5–6 drops phenolphthalein (2%) and complete the vol. to 110 cc. Filter the *pink* soln. To 11 cc. of the filtrate add 4 cc. of *C*, equiv. to 0.4 g. of *B* per l. of urine, allow to stand for 10 min., then filter. Add about 5 cc. of the filtrate to 20 drops of *D;* if a ppt. is formed at once, it indicates less than 0.4 g. *B* per l.; repeat the test with 11 cc. and, *e. g.*, 3 cc. of *C*. If a ppt. forms in a few seconds, try again, with 3.5 cc. When the ppt. is formed in 2 min., try 3.8 cc.; when it appears between 3 and 5 min., the detn. is ended. If, however, at first, no ppt. is seen after 5 min. more than 0.4 g. *B* per l. is present; then try 11 cc. with 6, or 8 cc., etc., of *C* until pptn. takes place, and proceed as in the first case. This method is exact to 0.05 g. of *B* per l. If urine contains more than 2 g. per l., any albumin or peptone present must first be removed to avoid too high results. S. W.

Stable colorimetric scales for measuring the indexes p_H (Bruère) 7.

Preserving animals and plants. F. Hochstetter and G. Schmeidel. U. S. 1,602,489, Oct 12 The texture of specimens is fixed, *e. g.*, by a CH_2O soln., and they are treated with alc. contg. PhOH, soaked with C_6H_6 or other solvent for paraffin contg. PhOH, and this solvent is displaced by molten paraffin which is finally allowed to harden.

C—BACTERIOLOGY

A. K. BALLS

The carbohydrate metabolism of acetone-butyl alcohol fermentations. G. W. Freiberg. *Proc. Soc. Exptl. Biol. Med.* **23,** 72–3(1925).—During the growth of the culture, carbohydrate disappears, acetic and butyric acids are produced and reduced to their corresponding alcs. A certain amt. of carbohydrate is incorporated into the protoplasmic structure of the cells. Acetone is produced according to the general reaction $C_6H_{12}O_6 + H_2O \longrightarrow C_3H_6O + 3CO_2 + 4H_2$. Butyl alcohol is formed as follows: $C_6H_{12}O_6 \longrightarrow C_4H_{10}O + 2CO_2 + H_2O$. Acetic acid may be produced as follows: $C_6H_{12}O_6 + H_2O \longrightarrow 2CH_3COOH + 3H_2 + CO_2 +$ (C and O, which are incorporated into the cell structure). Similarly $C_6H_{12}O_6 \longrightarrow C_4H_8O_2 + CO_2 + 2H_2O +$ (C, used in building cell tissue). Glucose may be broken down as follows: $C_6H_{12}O_6 \longrightarrow C_4H_8O_2 + 2H_2 + 2CO_2$ and $C_6H_{12}O_6 \longrightarrow 3CH_3COOH$. All of these reactions may take place simultaneously. C. V. B.

The effect of beta rays on bacterial growth. C. H. Boissevain. *Am. Rev. Tu-*

berculosis **14,** 172-6(1926).—Long's synthetic medium (*C. A.* **19,** 999) was used for studying the effect of other elements by replacing the K by equimol. amts. of LiCl, NaCl, RbCl, CsCl, VCl_2 and UCl_4. Serial inoculations of tubercle bacilli in new flasks contg. Rb or U showed the same growth as the original flask. The Rb cultures of tubercle bacilli grew more abundantly than the K cultures, while the U cultures grew less. Bacilli grew abundantly and with undiminished virulence on media contg. Rb and V instead of K and Fe. Cs and Rb are difficult to sep.; one of them favors the growth of tubercle bacilli more than K and the other is without effect, suggesting that the β-rays of K and Ru may be important. H. J. CORPER

Antiseptic properties of the amino derivatives of styryl- and anilquinoline. C. H. BROWNING, J. B. COHEN, S. ELLINGWORTH AND R. GULBRANSEN. *Proc. Roy. Soc.* (London) **100B,** 293-325(1926).—Ninety-four compds. were synthesized, and a study was made of the action of each compd. on *Staphylococcus aureus* and *Bacillus coli* in peptone water and in serum. The fundamental compds., 2-*p*-aminostyrylquinoline methochloride and 2-*p*-aminoanilquinoline methochloride, are moderately powerful antiseptics for staphylococci, but have a less marked action on *B. coli*. Changes in chem. constitution generally give rise to closely similar effects upon the antiseptic properties of the two series. With respect to substitution in the benzene nucleus, the *p*-compd. is more potent than either the *o*- or the *m*-compd.; the antiseptic action tends to increase if a tertiary basic group be substituted for a primary basic group, and tends to decrease if the NH_2 group be acetylated. With respect to substitution in the quinoline nucleus, the effect of a primary amino group is somewhat indeterminate, replacement of the 6 amino group by a $(CH_3)_2N$ group increases the potency but little, its acetylation tends to increase the potency, and its formylation to decrease the potency; acidic groups in position 6 generally decrease the potency. The chief influence of sulfonation is to increase the soly. of the compd. Certain azo dyes of this series practically lack antiseptic power. Derivs. of lepidine are far less active than the corresponding quinaldine compds. Quaternary salts of the quinoline N with Et and with Me are equally active. The influence of the acid radical upon the activity of the quaternary salt is uncertain. Certain of the compds., especially the styryl derivs., posess marked trypanocidal action in infected animals. JOSEPH S. HEPBURN

The rationale of the bile solubility of pneumococcus. E. E. ATKIN. *Brit. J. Exptl. Path.* **7,** 167-72(1926).—Strains of pneumococcus (types I and II) which autolyzed better when grown on horse serum agar slopes at a reaction of p_H 7.8 than on slopes at a reaction of p_H 7.5 were also more sol. in bile (Na desoxycholate) when grown at the former reaction; with type III p_H 7.6 was the optimum reaction, both for autolytic action and bile soly. The organisms in the papillae which develop on an autolyzed colony from a point inoculation on a thick serum agar medium of suitable reaction are quite insol. in bile. These papillae are devoid of autolysin and the organisms retain their Gram-staining property. The organisms of the papillae are alive, and a subculture from them on a fresh serum agar slope recovers its autolytic property, and at the same time, its bile soly. It is evident that the bile soly. of pneumococcus is due to an acceleration of the normal autolytic process by this substance, and that no soln. of the organism occurs except in the presence of the autolysin. H. F. H.

Chemical constitution and preservative properties. TH. SABALITSCHKA AND R. K. DIETRICH. *Desinfektion* **11,** 67-71(1926).—The inhibiting effect on the growth of *Penicillium glaucum* spores and mycelium, and partly also of *Micrococcus candicans, Sarcina flava,* and *B. coli* was tested in a yeast ext.-peptone-agar medium. The following were the inhibiting concns. (in %): *aliphatic and inorg. acids*—HCO_2H 0.036 increasing for AcOH and HCl, H_2SO_4 and maleic acid. The remaining acids examd. were ineffective in the concns. used. *BzOH derivs.*—3,4-$Cl(HO)C_6H_3CO_2Me$ 0.036; BzOH, Me anisate, *m*- and *p*-$HOC_6H_4CO_2Me$ 0.071; anisic acid, *p*-$ClC_6H_4CO_2H$ 0.143; *m*-$ClC_6H_4CO_2H$, *p*-$BrC_6H_4CO_2H$, *m*-$HO_3SC_6H_4CO_2H$, cuminic and salicylic acids 0.2140; acetylsalicylic acid, *o*-$ClC_6H_4CO_2H$ 0.286; BzONa, 1.5; Na salicylate 4.3. *Phenols.*—Phenol, thymol, carvacrol 0.014; Me cinnamate, Me phenacetin 0.071; pyrocatechol dimethyl ether, ψ-cumidine, phenylacetic acid 0.143; hydroquinole, pyrogallol and phloroglucinol had no effect at 1.4%. Protocatechualdehyde, mandelic and benzilic acids, cinnamyl and eugenol are also remarkably ineffective. This is in harmony with Pfeffer's observation that resorcinol is a source of C to *Aspergillus*. This tendency of all phenols increases with the no. of OH. Of the substances examd. the mono phenols are the most powerful preservatives. The introduction of OH or CO_2H into phenols or carboxylic acids, and of SO_3H and NH_2 into the latter has an unfavorable effect, which may be explained by Schoeller and Heck's theory of hydration centers. NH_2 increases the activity of cyclic hydrocarbons; the effect of Cl depends on the compd.

into which it enters The position of a substituent is also of importance. Salt formation diminishes the preservative power of aromatic acids considerably, while esterification (with exception of the liquid salicylates), etherification of some phenols and the introduction of OEt into methylacetanilide have the opposite effect. This led to the expectation of an essential influence of the reaction of the medium on the activity of this group The assumption was only partly confirmed by expt.: p-$HOC_6H_4CO_2H$ is inactive in alk. medium, while the slight activity of p-$ClC_6H_4CO_2Na$ becomes marked in acid medium On the other hand the min. active concns of the following esters were the same in alk and acid medium: p-$HOC_6H_4CO_2Me$ (I) 0.36-0.37, Me anisate, 0.36 0.38, 3,4-$Cl(HO)C_6H_3CO_2Me$ 0.18-0.19. I, which is marketed as Solbrol and Nipagin, is recommended as a preservative for foods. Doses of 2 g daily continued for 1 month had no untoward effects Discoloration or turbidity of the medium does not occur. MARY JACOBSEN

Types of meningococci. III. Behavior toward chemicals. K. W. JOTTEN AND M LUDKE *Arb Reichsgesundh.* **57**, 271-89(1926); cf. *Arch. Hyg* **94** and **95.**—The purpose of the expts was to find a chemotherapeutic treatment for meningitis. The toluene (Flexner) and Na taurocholate (Ficke) autolysis permits only the differentiation of the German types A I, II and III and the English types E I and III from other Gram negative cocci. While these types are completely dissolved, the resistance increases in the following order: C, B, esp strains L 15 and 12 of group B. Of the English groups E II is as resistant as B, IV is more susceptible The same sequence of resistance was found for all chemicals studied The results *in vivo* (white mice) differed largely from those obtained by Jotten *in vitro* and by Jochmann in clinical cases All Ag prepns., $KMnO_4$, trypaflavin, argoflavin, sinflavin and optochine proved altogether ineffective Yatren showed a certain action attributable to storage in tissue and transportation (different site of injection of yatren and cocci). The same was observed for arsphenamine, which, however, was far less effective than Ag arsphenamine Pyoktannin and $HgCl_2$ gave inconsistent results Quinine-$HgHSO_4$ Hoechst was somewhat more satisfactory. Good results which may become of value in therapy were obtained *in vitro* and *in vivo* with *eucupine* and *vucine* and particularly with an electrocolloidal *Mo soln.* of Chem. Fabr. Heyden contg. 0 4% Mo. A dose of 0.2 cc of the latter proved sufficient in 6 expts MARY JACOBSEN

Toxin formation by Shiga-Kruse bacilli in broth of different p_H. M. SARDJITO. *Geneesk Tijdschr. Nederland Indie* **66**, 337-41(1926) —In 5 broth cultures of Shiga-Kruse bacillus with an initial p_H ranging from 7 75 to 8 3 the p_H first decreased then increased, reaching 7 8 for all cultures on the 7th day. Toxin formation began after a week, attained its max between the 14th and 21st day and declined again. The culture with the initial p_H 7 5 had the max toxicity, 0.01-0 02 cc being fatal to white mice. MARY JACOBSEN

The bactericidal effect of sputokrimp on tuberculous sputum. S. POSTMUS. *Geneesk. Tijdschr Nederland Indië* **66**, 375–8(1926) —Sputokrimp (I) manufd. by Utrechtsche Asfaltfabriek is a brown fluid of pleasant odor (compn. not given). In comparative expts with 5% lysol, creolin, sapocarbol, izal and 20% antiformin with 3 hrs' contact, complete disinfection was brought about by a 5% soln. of **I** only. M J.

Acids as intermediate stages in the oxidation of sugars by fungi. WL BUTKEVITSCH *Jahrb. wissen. Bot.* **64**, 637 50(1925) —Gluconic and citric acids are formed apparently directly from sugar by *Aspergillus niger, Citromyces glaber, Penicillium glaucum* and related fungi. The previous failure to detect citric acid (*C. A.* **19**, 1878) was accounted for by lack of acidity in the culture media Low acidity favors the formation of gluconic and high citric acids The general occurrence of gluconic acid indicates that it is a normal intermediate product in the aerobic oxidation of sugars. A scheme is suggested to account for the citric acid by the oxidation of gluconic acid. W. NEWTON

Sugar-inverting bacteria and their industrial application for the preparation of fatty acids, especially lactic, acetic and butyric acids, and also acetone, ethyl and butyl alcohols and mannitol. G MEZZADROLI. *Giorn. chim. ind applicata* **7**, 563–8(1925).—A description and classification of certain bacteria from the point of view of their sugar-inverting properties, and of the products formed by the fermentation. R. S. P.

Determination of viable Lactobacillus acidophilus. W. L. KULP. *Science* **64**, 304–6(1926) —CO_2 in amts. varying between 1 and 10% of the total gas of the container causes an increase in the growth of *L. acidophilus*. Some strains are more susceptible to the CO_2 than others. Details are given for prepg and incubating cultures of *L. acidophilus* in an atm. contg. from 5 to 10% of CO_2. The yields were estd. by plating it and counting colonies. L. W. RIGGS

Bactericidal action of cadmium compounds. E A. COOPER AND L. I. ROBINSON.

J. Soc. Chem. Ind. **45,** 321-3T(1926).—The germicidal action of inorg. Cd compds. was less than that of the Hg and Ag compds but greater than most of the other inorg. compds. Org. Cd compds. were less efficient than the inorg. In the presence of blood serum the Cd compds. were not very efficient. F. W. TANNER

D—BOTANY

B. M. DUGGAR

Variations in the composition of Colorado potatoes. N. E. GOLDTHWAITE. Colorado Agr. Expt. Sta , *Bull.* **296,** 3-77(1925).—Analyses were made of 11 varieties of potatoes. No 2 potatoes having identical compn. were found in the same variety, or in the same group or even in the same hill The size of a potato is no criterion of its maturity. Potatoes which have the longest growing season are most mature The percentage of dry matter in potatoes varies inversely with the percentage of H_2O, and in general, the percentage of starch and total carbohydrates varies likewise. There is little relationship between the N matter and ash in potatoes, except sometimes a purely local one There appears to be no relation between H_2O received and H_2O in the potato. The quality depends more upon the grower, soil and season than upon variety. With irrigated potatoes, the percentage of dry matter less 6 71 gives an approximation of the percentage of starch. Very wide variations may, however, be encountered. Among irrigated potatoes the following approx. ratios were found: starch %:dry matter %: .1 1 42. Total carbohydrates %:dry matter : :1:1.15, starch %:H_2O%: .1:1 5 (wide approximation) Total carbohydrates:H_2O %: :1:3.897 (wide approximation) The percentage of H_2O in the cortex is less than in the corresponding medullary area while the percentages of dry matter, starch, total carbohydrates and ash are each greater. On the fresh basis, the N matter does not follow any uniform law but on the dry basis total N is less in the cortex than in the corresponding medullary area. In general the compn of potatoes on the dry basis shows as little uniformity as on the fresh basis On the dry basis 1 const seems to hold: starch %:dry matter %: :1:1.25. M. S ANDERSON

Fluid crystals and meristematic growth. F. O. SCHMITT AND W. H CHAMBERS. *Proc. Soc. Exptl Biol Med* **23,** 134-5(1925).—The growing tips of the squash root were fixed by 2 to 3 weeks impregnation in 2% osmic acid after the Kopsch-Mann technic Unstained sections were mounted in balsam Intracellular granules of varying sizes but of uniformly high refringency were observed Near the tip the granules were small; in more remote cells they were much larger and not so numerous. Under the polarizing microscope they were found to be uniaxial spherocrystals Each displays a black cross in the center if the axis of the crystal is parallel to the optic axis of the microscope. The granules are in the *mesomorphic* state, neither fluid or cryst. They may be important factors in the high rate of activity of meristematic cells. C V. B.

Investigation on plants causing hay fever in and around Utrecht. C. E. BENJAMINS, J. IDZERDA AND H. VITTIEN. *Nederland Tijdschr. Geneeskunde* **70,** I, 935-45; II, 18-29(1926).—A continuation of the work described in *C. A.* **17,** 1277. Glycerol was found to have a protecting influence on the plant exts, preventing the decompn. of the active substances contained in them. R. BEUTNER

The yellow chromophore pigments of higher plants. HARALD KYLIN. *Z. physiol. Chem.* **157,** 148-62(1926) —Examn. of exts of the coloring matter of green plants by Goppelsroeder's method of capillary analysis (color bands on filter paper due to differences in soly. and rate of absorption) shows 2 yellow and 2 green bands. The 2nd green band is more pronounced after prolonged extn with EtOH and is absent after extn. with boiling EtOH. This phenomenon is due to the presence of an enzyme, chlorophyllase, which converts natural chlorophyll into ethylchlorophyllide during the prolonged extn. but is destroyed by boiling. The amt of enzyme varies with different species of plants, as shown by differences in intensity of the 2nd band. The 2 yellow bands have been attributed to carotin and xanthophyll. The latter is not homogeneous, however, but contains in addn. to the orange xanthophyll a pure yellow component which is distinguished from xanthophyll by its change to green when treated with HCl. The name *phylloxanthin* is proposed for this modification of xanthophyll. A narrow red band was also observed between the carotin and xanthophyll bands. This pigment which occurs in relatively small amt. was shown to be identical with the rhodoxanthin of *Reseda lutea.* It occurs in etiolated as well as in green plants. Pringsheim's so-called etiolin is a mixt. of the normally occurring carotinoid pigments. Yellow autumn leaves contain the same pigments but in different proportions.

A. W. DOX

Action of electrolytes on the life activities of Gonium pectorale and Pandorina Morum. TETSU SAKAMURA. *Bot. Mag. Tôkyô* **38**, 79–93(1924); (Japanese.) *Botan. Abstracts* **15**, 323–4. H. G.

Carbohydrate metabolism in the foliage leaves of Nicotiana tobacum L. DIRK TOLLENAAR. *Lab. Landbouw-Scheikunde Lab. Plantenphysiol. Onderzoek* **12**, 1–142; *Botan. Abstracts* **15**, 175–6.—A series of studies is made on carbohydrate formation and decompn. in the leaves of tobacco. The formation of starch was studied in the normal plant and in leaves in sugar soln. It is believed that a monose sugar is the 1st detectable step in photosynthesis; that in most instances the process leads immediately to the formation of starch; and that much of the starch is used directly in respiration rather than being transported. The effect of tobacco mosaic on the conversion of starch is discussed. The application of the exptl. results to the curing of tobacco is discussed and it is pointed out that leaves in dry air lose their starch more rapidly than those kept in moist air after removal from the plant. H. G.

Absorption of water by barley seeds. H. S. WOLFE. *Bot. Gaz.* **82**, 89–103(1926).—The grain used was that employed by Pickler (*C. A.* **14**, 1359). The method employed was that outlined by Brown (*Ann Botany* **21**, 79(1907); cf. *C. A.* **2**, 1477; **3**, 1538). Air-dry barley grains are not able to exert such internal imbibitional force as would be indicated by Pickler's observation of 27% intake of water in 12 hrs. from LiCl against an osmotic pressure of 1000 atm. The seeds, however, are able to take in about 3.6% of water from such a soln. in 12 hrs at 30°. Gain in wt. in soln. is not an indication that seeds are withdrawing water from the soln. As much as half of this gain in wt. is due to absorbed salt. BENJAMIN HARROW

The phosphate content of sea-water in relation to the growth of the algal plankton. III. W. R. G. ATKINS. *J. Marine Biol. Assoc.* **14**, 447–67(1926); cf. *C. A.* **19**, 3291—The present paper deals with the seasonal changes for 1925 and their onsets were compared to those of the two preceding years. The vernal diminution of phosphate content of the water in the English Channel was earliest in the year 1924 and latest in 1923, these differences standing in direct relation to the spring sunshine. The year 1925 was in general similar to the other two in having a summer phosphate minimum and a winter max. Additional evidence has been found which shows that the deep water of the ocean is the reservoir of phosphate, contg. 50–80 mg. per cm or more. Water of the North Sea was markedly richer in phosphate in the spring of 1925 than that of 1924 as was also the water around the Faroe-Shetland Channel in July, 1925, as compared with the previous July. In tropical waters the intense light normally results in the utilization of all phosphate down to at least 50 m., and the winter cooling never suffices to effect mixing with the deeper water. N. KOPELOFF

Oxidases of algae. O. GERTZ. *Biochem. Z.* **169**, 435–48(1926).—Of 35 algae found on the Swedish west coast 25 contained oxidases. Thirteen contained oxidases in relatively large amts. W. D. L.

Acetaldehyde is an intermediary product in the germination of seeds which contain fats. K. PIRSCHLE. *Biochem. Z.* **169**, 482–9(1926).—Seeds which contain much olein are germinated, and at definite intervals are analyzed for their AcH content. Considerable amts. of AcH are found. It is probable, therefore, that in the metabolism of fats by germinating seeds, AcH is an intermediary product, and it may be formed in the conversion of fat into carbohydrate. W. D. L.

Mechanism for the formation of lactic acid by phanerogams. C. NEUBERG AND G. GOPP. *Biochem. Z.* **171**, 475–84(1926).—Sterile peas when allowed to stand in Na_2CO_3 soln. in the presence of methylglyoxal convert the methylglyoxal into lactic acid. The same occurs when a water ext. of the peas, or an alc.-ether ppt. from this ext. is used in place of the peas. The conversion to lactic acid is usually about 75% complete in 20 hrs. W. D. L.

Some nitrogenous constituents of the cauliflower bud. I. Protein fractions. MARY C. MCKEE AND A. H. SMITH. *J. Biol. Chem.* **70**, 273–84(1926).—"Analysis of the edible portion of the cauliflower (considered to be a malformed and condensed flower stem and buds of flower clusters) shows that approx. 68% of the N of this part of the plant belongs to constituents sol. in H_2O or dil. salt soln.; 12% to compds. insol. in H_2O but sol. in dil. alk.; and 16% to substances insol. in both H_2O and dil. alk. A further fractionation of the combined expressed juice and aq. ext. showed that it contd. about 8% of the total bud N as NH_3N; 19% as free amino N; 5% as amide N; and 11% as N in actually isolated protein prepns. Dil. NaOH soln. extd. about 11% of the total N of the bud; 3% of the total cauliflower N was subsequently sepd. as a protein prepn. Two prepns. rich in N and giving the protein color reactions have been isolated and contained, resp., the following % of arginine 5.02 and 5.87, histidine

2.19 and 3.06, lysine 7.41 and 7.53. In both products, however, the % of N (13.4) was lower than that usually found in pure proteins; both contained carbohydrate and perhaps other org material." A. P LOTHROP

Effect of neutral salts on the permeability of plant protoplasm to hydroxyl ions. II. JAAN PORT *Biochem Z* **170,** 377 85(1926), cf *C. A* **20,** 1831 The effect of neutral salts on the permeability of the protoplasm of leaf cells of Viola tricolor to NH_4OH and CH_3NH_3OH is very nearly the same, and at the same p_H even identical The NH_4 salts increase the permeability of OH ions in the following order of anions: CNS > NO_3, Cl > SO_4 The alkali salts (K, Na, Li, Rb, Cs) inhibit the permeability of OH ions in the order CNS < NO_3, and Cl, Br < SO_4 The salts of Mg and Ca inhibit the OH permeability very greatly. At the same p_H of the solns the inhibitory and stimulating action of the various salts is practically of the same value, so that only the cation effect remains With KOH the influence of the neutral salts is much more complex Only Mg salts inhibit the permeability of the OH ions into the cells, all other salts having a stimulating effect in this case The greatest stimulating effect is due to NH_4 salts, LiCl and BrCl, and the least stimulating effect is due to $LiNO_3$, NaCl, RbCl, CsCl, Cs_2SO_4 and $CaCl_2$ S MORGULIS

Microchemical identification of potassium in plants as picrate. N PATSCHOVSKY *Ber deut. botan Ges* **43,** 489-96(1925) —K may be identified in plant material as picrate crystals by treating with solns of picric acid in water, alc, Et_2O, petroleum ether and benzene. The advantage of an alc soln for fresh material is due to the high soly of picric acid and the low soly of the K picrate in alc Picric acid in Et_2O and petroleum ether do not disturb the normal distribution of the K in the fresh tissue on account of their slight miscibility with the cell contents but both solns enter the cells readily and K picrate crystals are slowly formed. The evapn of the alc. or ethers causes the crystals to dissolve unless prevented by examn in a closed cell or under glycerol The Ca, Na and NH_4 cations of plant tissue may form picrate crystals but they can be readily distinguished by their characteristic crystal forms and are less frequently formed because of their high soly Ashing is sometimes necessary to prove the presence of K in plant tissue by picric acid The standard Na cobaltinitrite and $HClO_4$ method for the detection of K used in conjunction with picric acid shows the crystal transformation of the K picrate to K cobaltinitrite to $KClO_4$, reactions not characteristic for Na or NH_4 A list is given of plant material giving positive K tests by the picric acid method W NEWTON

Chemotropism of plant roots. TH M. PORODKO. *Jahr. wiss. Botan* **64,** 450-508 (1925) —Chemotropism depends upon unilateral stimulation by electrolytes only and varies with the concn, low concns give positive curves and high concns give negative curves Cations cause negative curves and are effective inversely porportional to their electrolytic soln pressures Anions cause positive curves and are effective directly proportional to their lyotropic powers The total effect of a single electrolyte is equiv to the algebraic sum of the influences of its ions The region of chemotropic sensitivity is confined to the last mm of the root tip. W. NEWTON

Influence of lead and the metallic ions of copper, zinc, thorium, beryllium and thallium on the germination of seeds. W J. DILLING. *Ann. Appl. Biol* **13,** 160 7 (1926) --Pb salts at concns > 0 01% of Pb ion delay the germination of cress and mustard seeds; at 0 1-0 2% concns the Pb ion inhibits germination for 18 days or more without destroying the vitality of the seeds Th, Zn and Gl gave similar but less marked effects Cu stunts the growth of inhibited seeds whereas Tl destroys their vitality C. H R

The effect of metallic ions on the growth of hyacinths. W. B. BELL, M. D. LOND AND J. PATTERSON. *Ann Appl. Biol.* **13,** 157-9(1926) —Hyacinths were grown in solns contg. Pb, Ca, Cu and Zn ions Strong solns of Pb ions inhibit growth and flowering Pb is taken into the plant and probably has some effect upon the function of the phosphatides. Cu and Zn ions are directly poisonous; in graded concns they do not produce a graded effect of stunting, and either kill the plant or are harmless. Ca ion has only a temporary effect and probably acts by reducing the permeability of the cell membranes. C. H. R.

A chemical and physiological study of maturity in potatoes. C. O. APPLEMAN AND E. V. MILLER *J. Agr. Research* **33,** 569-77(1926) —The ripening and maturing processes in potatoes may continue during storage so that by the end of the rest period immature potatoes large enough for seed have practically the same percentage compn and respiratory response as potatoes allowed to mature on the vine if both are stored under the same conditions. The results obtained do not reveal any chem. or physiol. basis for the superiority of immature potatoes for seed The cases reported of immature

seed giving better results than mature seed may have been due to greater freedom from degeneration diseases in the immature seed. W. H Ross

Seed stimulation. TACKE. *Landw. Vers Sta.* **104,** 153-8(1925).—Review of results obtained at 6 expt. stations in Germany. It has been claimed that preliminary soaking of seeds in solns. of salts of Mg, Mn and other metals or of mixts of various substances stimulates germination and increases yields The expts. include trials with seeds of a no. of crops and in no case was any significant advantage obtained by any of the treatments. F M. SCHERTZ

A chlorophyll-free bud variation, found as a sucker of cane variety 2878 POJ. J KUYPER *Arch Suikerind.* **34,** 708-9(1926).—This stalk, 1.9 m long and very thick, was found in a seed cane field It showed no chlorophyll, excepting a small green stripe on the 2nd internode. Anthocyanin was present, however, the stalk having a pale rose tint. F. W. ZERBAN

The constituents of corn cockle seed (WEDEKIND, KRECKE) **10.** Aging of plant fibers (SCHWALBE) **23.**

E—NUTRITION

PHILIP B HAWK

The specific dynamic action of carbohydrates. H J DEUEL, JR AND I SANDIFORD. *Proc Soc Exptl Biol Med* **23,** 85 7(1925) —An open-circuit type of respiration app. was used in detg the respiratory quotient (R Q) and the heat production in a man (H J D), before and following the ingestion of 75 g of various sugars The sp dynamic action of sucrose, fructose, galactose, lactose, glucose and of maltose reached a max in 2 to 2 5 hrs and passed off in 4 5 hrs Sucrose and fructose caused a rapid rise in the R Q , which reached the max in the 2nd 10 min. period Galactose and lactose had a less marked effect on the R Q Glucose and maltose caused but a slight change in the first 30-45 min and the rise which followed was less than with the other sugars Raw and dried cooked starch increased the R Q to a max. of 0 90 in the 3rd hr , the heat production was but slightly affected, showing that the slow absorption prevented a plethora metabolism C V B

The vitamin-C-content of raw and pasteurized milk. E C VAN LEERSUM. *Nederland Tijdschr Geneeskunde* **70,** I, 338 48(1926) —Raw milk fails to prevent scurvy in exptl animals unless it is quite fresh. In contact with air—especially if shaken with it —it soon becomes inactive Oxidation rapidly destroys the unstable vitamin C, even at ordinary temp R. BEUTNER

Experimental studies on nuclein metabolism. XIV. The question of uricolysis and uric acid excretion. S J THANNHAUSER, L LURZ AND P V GARA *Z. physiol. Chem* **156,** 251 67(1926) —Folin's assumption of a uricolytic enzyme in the circulating blood of the dog is rendered untenable by a critical examn of the exptl data The fact that injected uric acid disappears from the circulation of the living dog but remains intact for hrs if the animal is killed immediately after the injection does not postulate a uricolytic enzyme in the blood of the living animal. Such an enzyme is actually present in the liver. The death of the animal then stops the circulation of the blood through this organ and the uric acid is not brought into contact with the enzyme Folin's observation that injected uric acid accumulates in the kidney was confirmed. This function of the kidney is intimately related to uric acid excretion Even the transplanted enervated kidney maintains this power of concg. uric acid from the blood, though to a smaller extent than the normal organ. Excretion of uric acid by the intestine is negligible After removal of the kidneys the intestine shows no increase in uric acid content and thus no vicarious function in the elimination of uric acid. [illegible] proceeds directly through the organs of [illegible]

[illegible] deficiency of vitamin C in the diet gave rise to abnormal dentine, a deficiency of vitamin D to abnormal enamel, and a deficiency of both vitamins to abnormalities of both tissues An excess of Ca, *e. g.*, Ca lactate, in the diet accentuated the results produced by a deficiency of either or both vitamins. Ca and an excess of vitamin D produced excessively hard teeth. An adequate balance between the 2 vitamins produced normal teeth, either with or without an excess of Ca JOSEPH S. HEPBURN

Role of the inorganic elements in nutrition. H. B. LEWIS. *Dental Cosmos* **68,**

950–8(1926).—Review with especial reference to I, F, Cu, Ca and P, and rickets.
JOSEPH S. HEPBURN

Statistical observations on beriberi in Japan. R. TAKANO *Japan Med. World* **6,** 8–10(1926).—The incidence of beriberi increases with high temp., humidity and crowding in urban centers. In adult cases the number of deaths among males are twice those of females, although this sex difference does not hold for breast-fed infants, who succumb most frequently to the disease. The number of deaths from beriberi of breast-fed infants are so numerous that they exceed one half of the deaths from the same disease among those other than infants. A table of rice consumption and deaths from beriberi from 1914 to 1924 is given.
N. KOPELOFF

Intestinal chemistry. IV. A method for the study of food utilization or disgestibility. OLAF BERGEIM. *J. Biol. Chem.* 70, 29-33(1926); cf. *C. A.* 19, 668.—"A simplified method is presented for the detn of food digestibility and utilization. Fe_2O_3 [or $Fe(OH)_3$] is added to the food and by detg the ratio of the amt. of any given food substance to the amt of Fe in the food and in the feces the % utilization may be calcd. Accurate account of food ingested, sepn , and complete collection of feces are not essential for this method which thus becomes available in many cases where the more elaborate procedure would not be employed. The method is applicable to studies on small animals such as albino rats. **V. Carbohydrates and calcium and phosphorus absorption.** *Ibid* 35-45. -Albino rats were used in the expts and the Ca·Fe and Ca·P ratios were detd in the food and also in the feces or intestinal contents. As the Fe is not appreciably absorbed, the % of Ca or P absorption could be readily calcd Starch, glucose, fructose and maltose added to the diet in amts. of 25% did not increase Ca or P absorption, if 50% was added there was some slight increase. Dextrin had little effect in smaller quantities but a distinct influence in larger. On the other hand lactose even in the proportion of 25% caused marked increases in the absorption of P and Ca, the effect on Ca being greater than on the P. The influence of lactose and to a lesser extent of the other carbohydrates is believed to be due to increased lactic acid fermentation in the intestines with resulting increased acidity of the intestinal contents which increases the soly. of such salts as $Ca_3(PO_4)_2$. Lactose did not prevent the development of rickets on diets high in Ca but low in P and antirachitic substances **VI. A method for the study of absorption in different parts of the gastrointestinal tract.** *Ibid* 47-50—The ratio of the amt of Fe_2O_3 or other unabsorbable substance to the amt of any other substance present is detd. for the food and for the intestinal contents at different levels The method may be applied to material obtained from the intestines of animals killed at the height of digestion or from intestinal fistulas **VII. The absorption of calcium and phosphorus in the small and large intestines.** *Ibid* 51-8 -"Animals rendered rachitic by P-low diets as well as such animals given cod-liver oil showed a considerable degree of Ca absorption from the small intestine The rachitic condition could not therefore be due to a failure of Ca absorption Both groups of animals showed a considerable secretion of PO_4 into the upper tract. This secretion appears to be an important factor in promoting Ca absorption as the latter was most rapid where the P.Ca ratio was highest. The animals given cod-liver oil showed a positive Ca balance throughout the intestines. P secreted into the upper tract was absorbed in the lower intestines to produce an ultimate positive balance of this element also. In the rachitic animals the Ca absorbed in the upper intestine was excreted into the lower intestine, leading to a negative or subnormal balance. Coincident with this marked excretion of Ca into the lower bowel there was a failure of P to be adequately reabsorbed and hence a loss of the latter to the body The failure of absorbed Ca to be used in calcification is believed to be due to the low PO_4 concn. of the blood. Antirachitic substance may act by elevating blood PO_4 by promoting the breakdown of org. tissue PO_4, thus leading to increased deposition of Ca with lessened excretion into the gut and consequent better absorption of PO_4 therefrom "
A. P LOTHROP

The antirachitic value of irradiated cholesterol. II. A separation into an active and an inactive fraction. A. F. HESS, MILDRED WEINSTOCK AND ELIZABETH SHERMAN. *J Biol Chem* **70,** 123-7(1926); cf. *C. A.* **20,** 1834.—Irradiated cholesterol can be sepd. into an inactive digitonin-precipitable and an active non-precipitable substance provided the sepn of the cholesterol digitonide from the sol. fraction is carried out in an atm. of N_2 and the oily menstruum in which the fractions are suspended is mixed immediately with the fractions. Only approx. 5% of activated cholesterol possesses antirachitic properties These results link the specific antirachitic power of activated cholesterol with that of cod-liver oil, the potency of which has been found to be due entirely to its non-saponifiable fraction. It is probable that a close chem. similarity exists between

the active principles of these two substances and that their protective and curative action in rickets is due to a factor common to both. Irradiated cholesterol also contains an active fraction (about 4%) sol. in anhyd. liquid NH_3 and a similiar material has been obtained from the nonsaponifiable fraction of cod-liver oil. Probably the activity of cod-liver oil is to be ultimately ascribed to ultra-violet radiation either directly of the cod itself, or more probably, indirectly through the food. A. P. L.

Studies on the intermediate fat metabolism. I. Some experiments bearing upon the problem of the effect of fat feeding on carbohydrate metabolism. TOKURYNA TAKAO. *Biochem. Z.* **172,** 272-9(1926).—Three series of expts. were made. One series was with starving phlorhizinized dogs which received by stomach tube either 100 g. bacon fat or olive oil. The N and glucose were detd. in the urine and thus the D·N ratio was studied before and during the excessive fat feeding. The ratio is practically unaltered so that there is no evidence of a formation of sugar from fat. The abs. increase in the amt. of urine sugar is attributed to the glycerol of the fat. The second series of expts. was on fasting rabbits treated for several days with adrenaline injections, then fed variable quantities of olive oil by stomach tube. The urinary findings fail to indicate any new formation of sugar. In the third series, white rats were partly fasted for several days and partly fed on bacon. The livers of both rats were analyzed for total carbohydrate. Although in the rats fed on bacon the glycogen content was actually doubled, the source of the extra glycogen is thought to be the glycerol of the fat consumed. **II. The influence of certain inorganic ions on the formation and excretion of acetone bodies.** *Ibid* 280-95.—The effect of inorg. ions was studied on phlorhizinized dogs fed exclusively on lean beef guts which produce ketosis. NH_4 lactate and NH_4Cl, Ca lactate and the chlorides of Na, K and Mg were tested. The NH_4 salts both increased the ketosis; the NaCl had no demonstrable effect; and the KCl and $MgCl_2$ have also produced an increased ketosis both in blood and in urine. On the contrary, the Ca salts had the effect of reducing the ketosis both of the blood and urine. This reduction of acetone bodies in the blood proves that the diminished acetone excretion was not due to a loss of permeability of the kidney but to an actual reduction in the acetone body formation. A relationship between the elimination of the acetone bodies and sugar could not be demonstrated in any of the expts. S. M.

Studies on photoactivity. I. Influence of various vitamin carriers, especially liver oils, on photographic plates. HERMANN VOLLNER. *Biochem. Z.* **172,** 467-82 (1926).—The photochemical effect of liver oil and various other natural fats as well as miscellaneous substances was studied. The photochem. reaction, or photoactivity, has been detd. by means of their effect upon the highly sensitive Agfa-Ultra-special photographic plates, both with and without preliminary irradiation with Bach's solar light app. No generalization of the results has yet been attempted. S. MORGULIS

A study of the nutritive value of the Finnish beef. T. HAKKINEN, L. LUNDIN, M CH. EHRSTRÖM AND HARALD HANRIKSSON. *Skand. Arch Physiol.* **48,** 55-60(1926).—Three beef bodies as they are offered on the meat market of Helsingfors contained, resp , 75.9, 72.9 and 66.8% soft parts, the rest being bones. The edible part of the bones was 19.4, 15.2 and 8.9% of the dry substance, with a caloric value per kg. bone of 1733, 1297 and 737, resp. The compn. of the meat, grouped in 3 classes according to quality as half-fat, good and ordinary, was: protein 15.6, 16.5 and 17%; fat 14, 12 and 10%; ash 1.0, 1.1 and 1.2%; calories per kg. 1941, 1839 and 1627, resp. S. M.

Vitamin B requirement of the calf. S. I. BECHDEL, C. H. ECKLES AND L. S. PALMER. *J Dairy Sci.* **9,** 409-38(1926).—Rations consisting of corn gluten meal, com. casein, cane sugar, rice, pearled hominy, corn starch, dried sugar beet pulp, minerals and cod-liver oil are taken as adequate with the exception of vitamin B. Marmite as a source of vitamin B is added to the above for the check ration. The vitamin B-deficient ration permits rats to live no longer than 2-5 weeks. When given to cows in lactation the *milk* is only slightly deficient in vitamin B. Calves started on this milk, then raised on the vitamin B-deficient ration grow normally, and at maturity reproduce young. Conclusion: Either the calf does not require vitamin B, or, this vitamin is synthesized by the organisms in the alimentary tract of the animal. The latter view is favored, though no direct evidence is given. FRANK E. RICE

Antirachitic power of Wood's light. G. MOURIQUAND, M. BERNHEIM AND (MLLE.) THEOBALT. *Compt. rend.* **182,** 1490-1(1926).—White rats were fed a rickets-producing ration and were divided into 3 groups: (*a*) controls non-irradiated, (*b*) rats receiving ultra-violet light for 5 min. daily, and (*c*) rats receiving for 5 min. daily the radiations of the quartz-Hg-vapor lamp with the Wood's screen interposed. Groups (*a*) and (*c*) developed rickets; group (*b*) did not. A 4th group of rats was exposed to Wood's light for 90 min. daily and did not develop rickets. L. W. RIGGS

Effects of an exclusive long-continued meat diet. C. W. Lieb. *J. Am. Med. Assoc.* **87,** 25–6(1926).—A medical survey of Stefansson, the Arctic explorer, is reported in which his ancestry and physiologic life history are discussed in detail. S. lived altogether 11.5 years within the Arctic circle. During this period he lived for a no. of days totalling 9 years on an exclusive meat diet. His health during periods of meat diet was excellent. Constipation was never present, nor was it present in 600 Eskimos who ate meat exclusively during a period of 3 years. These observations indicate that the commonly accepted facts regarding a high protein diet may be questioned.
L. W. Riggs

Effect of polarized radiations on animal metabolism. S. S. Bhatnagar, R. B. Lal and K. N. Mathur. *Nature* **118,** 11–2(1926).—Two female rabbits of about equal wt. and pure white color were placed each in its air-tight chamber with glass sides, and provided with inlet and outlet tubes for respiration and controlled as in a respiration calorimeter. Control tests were made in the dark. Metabolic activity was increased by exposure to polarized light, but if the animals were placed in the dark after exposure to 2 kinds of light, the order of metabolic activities was reversed, that is, the animal exposed to polarized light showed diminished metabolic activity compared to its fellow exposed to ordinary light.
L. W. Riggs

Vitamin B deficiency manifesting itself for the first time in the second generation. Ira A. Manville. *Science* **64,** 256–7(1926).—An apparently normal young rat was placed on a diet contg. casein 18%, Steenbock's No. 40 salt 4, agar agar 8, dextrin 65, crisco 3, cod-liver oil 2, and a drinking fluid contg. water 86.4%, lemon juice 12, Fleischmann yeast (dry) 1.6. After being on this diet 140 days 6 young were born, one of which died in a few hrs. The remaining 5 were adequately nursed and grew normally for 15 days when 4 suddenly showed symptoms of polyneuritis, which diagnosis was confirmed in one animal by examn. of the sciatic nerve. On increasing the yeast in the mother's diet to 8%, 2 of the sick animals recovered, one completely, the other partially. The mother showed no symptoms of polyneuritis. It is suggested that vitamin B intake of expectant mothers be increased and the increase maintained through the lactation period. These findings should be of value in countries having a high mortality from beriberi in breast-fed infants.
L. W. Riggs

Modern cod-liver oil as a source of fat-soluble vitamins. A. D. Holmes. *J. Oil Fat Ind.* **3,** 310–4(1926).—American cod-liver oil has a higher potency than Norwegian oil; this is due to the fact that in America cod fishing continues through the yr., whereas in Norway it is confined to the spawning seasons; during the active stage of the reproductive cycle, the store of vitamins in the liver is materially withdrawn by the developing ova. Vitamin A, sepd. from cod-liver oil by Takahashi (*C. A.* **20,** 1653), has the compn. $C_{27}H_{44}O_2$. This is neither an aldehyde nor ketone, but rather the O atoms occur as hydroxyl groups, one of which reacted as a tertiary alc. In feeding expts. 0.001 to 0.005 mg. daily sufficed to meet the vitamin A requirements of young albino rats. When injected hypodermically a 0.125 g. dose was fatal in 2 hrs. The action of ultra-violet light on cholesterol and phytosterol may produce these vitamins.
E. Scherubel

Thrice-cooked vegetables for diabetics. H. A. Stillman. Missouri Agr. Expt. Sta., *Bull.* **228,** 62(1925).—In tests with 16 rats from 40 to 55 days old, receiving a basic diet of 15% purefied casein, 10% crisco, 72% cornstarch, and 3% salt mixt., satisfactory growth was obtained with 4 g. of raw spinach, but no growth with 4 g. of thrice-cooked spinach.
J. J. Skinner

The albino rat in biochemical investigation. A. L. Bacharach. *Pharm. J.* **116,** 629–30, 689(1926).—Notes on the breeding of a "standard rat" (*e. g.*, "Wistar rats") as an aid to reliable observations in the study of vitamins (cf. Willimott and Wokes, *C. A.* **20,** 937).
S. Waldbott

Food values of New Zealand fish. VI. Vitamin-A content of mutton-bird oil and of some fish oils (Malcolm) 12.

F—PHYSIOLOGY

E. K. MARSHALL, JR.

Rate of absorption of hexoses and pentoses from peritoneal cavity. C. F. Cori and H. L. Goltz. *Proc. Soc. Exptl. Biol. Med.* **23,** 122–3(1925).—The rate of absorption of sugar from the peritoneal cavity diminishes more and more, the longer the absorption is allowed to proceed. This is in marked contrast to the intestine, where the rate of absorption remains const. The peritoneal cavity is equally permeable for different sugars, in contrast to the intestines which show a high degree of selective permeability.
C. V. B.

The permeability of liver and muscles for hexoses and pentoses. C. F. Cori and H. L. Goltz. *Proc. Soc. Exptl. Biol. Med.* **23,** 124-7(1925).—When 60 mg. of sugar was injected intravenously into mice of 20 g. body wt., an equil. between the sugar concn of the blood and of the liver was reached in 1 min. after the start of the injection. All sugars penetrated the liver with equal rapidity. The muscles were less permeable. Three min. after the injection the ratio of blood sugar, liver sugar and muscle sugar was of the order 100:87:37. C. V. B.

The tolerance of rats for intravenously injected glucose. C. F. Cori. *Proc. Soc. Exptl. Biol. Med.* **23,** 127-30(1925).—The intravenous tolerance of non-fasting rats during amytal narcosis is between 2.2 and 2.5 g. of glucose per kg. of body wt per hr. C. V. B.

The excitant of respiration: action of carbonic acid, of hydrochloric acid and of sodium hydroxide. E. de Somer. *J. physiol. path. gén.* **24,** 1-10(1926).—The excitant of respiration or of the respiratory center is not the blood p_H but the alveolar CO_2, which has a peripheral pulmonary action constituting one of the mechanisms of reflex respiration. A. T. Cameron

Physiological study of blood platelets. C. Klecki and C. Pelczar. *J. physiol. path gén.* **24,** 11-28(1926).—Autolysis of blood platelets isolated from the citrated blood of the rabbit proceeds very slowly. The active substances extractable by normal saline preserve their physiol. action for several weeks. The physiol. action of such exts depends on the degree of decompn. Their intravenous injection results in an av. rise of temp. of 1.5°. The saline ext. contains coagulating constituents. A. T. C.

The physiology of the lactic acid of the blood. J. A. Collazo and E. Morelli *J physiol path. gén.* **24,** 54-60(1926).—The blood of different species contains different amts. of lactic acid In the same species the amt. oscillates between definite limits which are greater for small animals. There is no const ratio between blood lactic acid and blood sugar in different species. Under certain const. conditions the amt of lactic acid is almost const for each species. The lactic acid content of tissues and venous blood is greater than that of arterial blood. **II. Influence of diet and of anesthetics.** *Ibid* 76-85.—Expts. on dogs and rabbits gave the following results: On a mixed diet after a meal the max. lactic content of blood is reached a little later than the max. sugar content. Food (but not H_2O) starvation leads to a diminution for the first 2 days, and then a progressive increase. A diet of sugar and H_2O leads to an increase. A diet of lean meat and H_2O also produces an increase, producing no appreciable effect on the blood sugar. Fat leads to a diminution of both. Pigeons on a diet deficient in vitamin B showed marked increase of the acid. Muscular exercise leads to increase. The hyperglucemia of anesthesia is accompanied by increase in lactic acid This is probably independent of post-anesthetic acidosis and due to glycogen impoverishment There is an unexplained antagonism between lactic acid and the acetone acids. Subcutaneous injection of mineral acids lowers the blood lactic acid; injection of alkalies raises it. A. T. Cameron

Accidents in heterogeneous blood transfusion: role of hemolysis. III. R. Cruchet and J. Caussimon. *J. physiol. path. gén.* **24,** 61-75(1926).—Hemolysis is almost always produced in transfusion between animals of different species; it is usually slight, but takes place *in vitro* and *in vivo.* It dets. a transient urinary syndrome characterized by the presence of traces of albumin. In exceptional cases dangerous results follow, showing a tableau of a progressive and fatal anemia, not provoked by hemoglobin. A. T. Cameron

Role of water in the maintenance of the acid-base equilibrium of the blood. S. Ramos and L. G. Fox. *J. physiol. path gén.* **24,** 231-42(1926).—See *C. A.* **20,** 1843. A. T. Cameron

The supposed influence of insulin on sugar formation in the liver. I. L. Chaikoff. *Trans. Roy Soc. Can* **20,** Sect. V, 27-31(1926).—It is concluded that insulin has no influence on the rate of appearance of glucose or H_3PO_4 in incubated suspensions of (rabbit) liver tissue. A. T Cameron

Sugar tolerance in rabbits. Max Tiitso. *Trans. Roy. Soc. Can.* **20,** Sect. V, 33-44 (1926).—The starving rabbit is less able to deal with exogenous glucose than the normal organism. The probable explanation is that the internal secretion of insulin occurs more promptly in fed than in starved animals. Prolonged administration of thyroid does not cause so marked a depression of the hyperglucemic reaction in starved as in fed rabbits. Hyperglucemia following the administration of glucose per os is followed by hypoglucemia; this does not happen when the glucose is given subcutaneously. A. T. Cameron

Iodine distribution in the thyroid and its extracts with especial reference to the

inorganic, lipoid and protein iodine. H. E. Meyer. *Z. physiol. Chem.* **156,** 231–50 (1926).—The Rabourdin method, with a few slight modifications, is considered the most suitable for physiol.-chem. and clinical I detns. Substances contg. I may be extd. from the thyroid by Et_2O, EtOH and H_2O, but not by MeAc. The values obtained are very small, most of the I remaining in the residue. Of the 3 solvents, Et_2O, EtOH and H_2O, the last exts. the most I. By means of fractional extn. with EtOH and then with H_2O, the total I may be sepd quant. into 3 groups–inorg., lipoid and protein I. Complete extn. of the thyroid requires 300 parts of EtOH or 100–50 parts of H_2O. Preliminary extn. with EtOH and then extn. of the residue with H_2O makes possible the prepn. of an aq. thyroid ext. which is absolutely free from every trace of inorg. and lipoid I. A. W. Dox

The action of sugar in the organism. I. Sugar cleavage under the action of dilute alkali. F. Fischler. *Z. physiol. Chem.* **157,** 1–31(1926).—When a dil. soln. of pure glucose is distd. in the presence of dil. alkali, the distillate contains a small amt of methylglyoxal, which may be identified by the m. p. and analysis of its osazone. Fructose, galactose, maltose and lactose yield the same substance, but not sucrose, dulcitol, mannitol or sorbitol. The non-volatile residue, which is no longer alk , contains glyceraldehyde. The yield of methylglyoxal may be increased by adding more alkali from time to time during the distn. With as little alkali as $M/1500$ KOH or NaOH the formation of methylglyoxal may be recognized by the CHI_3 reaction of the distillate. The cleavage of hexose into 3-carbon compds under the influence of OH ions is, therefore, of possible significance in the biol. utilization of sugar The 1st effect of the OH ions would be a rearrangement of the glucose into its β- and then its γ-form These more labile forms should then form alkali glucosate with rupture of the oxide ring and finally undergo a cleavage into two 3-carbon chains A W. Dox

A cardiac stimulant excreted by the kidney. E. K Frey and Heinrich Kraut. *Z. physiol. Chem.* **157,** 32–61(1926) —The effect of an intravenous injection of urine is not a constriction or dilation of the blood vessels but a marked increase in activity of the heart. An injection of 3 cc. of urine into the hind leg vein of a 15 kg dog shows a twofold effect, a lowering of blood pressure and almost simultaneously an increase in amplitude of the heart beats, which reaches a max. in 25 sec. and remains above normal more than 120 sec. Attempts to isolate the cardiac stimulant resulted in a prepn. which in a dosage of 0 5 mg. was equiv. in activity to 5 cc of urine contg. 75 100 mg. of solids. By pptn. of the urine with $UO_2(OAc)_2$, elution with $(NH_4)_2HPO_4$, removal of phosphate by magnesia mixt and dialysis, the active substance was recovered in 50–80% yield Two mg. of this product was equiv to 5 cc. urine The same degree of purity was obtained by pptn with $(NH_4)_2SO_4$, EtOH and dialysis, but the yield was only half as large. The purity was then increased still further by adsorption on $Al(OH)_3$ and elution with $(NH_4)_2HPO_4$, giving a product of which 0 5 mg. corresponds in activity to 5 cc urine. This, however, does not represent a pure substance, although it fails to give any of the typical protein reactions A similar product was obtained from blood by the same procedure but in a lower state of purity. The active prepns. have no retarding influence on blood coagulation, except in doses large enough to produce other toxic symptoms. The amt. recovered from 60–80 cc. of blood was equiv. in activity to 5 cc urine. The daily excretion in the urine is thus 3 times the amt. present at any 1 time in the total blood. The substance is sol. in H_2O, insol. in org. solvents, is inactivated by boiling and does not diffuse through parchment. It is pptd. by phosphotungstic acid and other reagents for bases. Although its physiol. action resembles in some respects that of histamine, its chem. and phys. properties indicate greater complexity of structure. A. W. Dox

The intermediary metabolism of histidine. I. S. Edlbacher. *Z. physiol. Chem.* **157,** 106–14(1926).—The liver contains an enzyme *histidase* which hydrolyzes histidine with liberation of $^2/_3$ of the N as NH_3. The optimum activity is at p_H 9.0 and the cleavage still continues at p_H 5 but is suppressed at p_H 2. No urea is formed. The enzyme is stable at 50°, but is partially destroyed by 10 min. heating at 70° and completely by 10 min. heating at 90°. It is present in the liver of the dog, guinea pig, rabbit, goose, chicken and frog, but not in the kidney, spleen, pancreas, intestinal mucosa, thyroid, testis, ovary or muscle. The NH_3 liberated comes in part from the NH_2 group and in part from rupture of the imidazole ring. The max. yield of NH_3 was 62%, or 90% on the basis of $^2/_3$ of the total N. Recovery of histidine as picrolonate was altogether too small to account for the remaining $^1/_3$ as unchanged substance. A. W. Dox

Test of gastric secretion without removal of the stomach contents. Bruno Lewin. *Deut. med. Wochschr.* **52,** 1427–8(1926).—Fifteen parallel detns. were made to ascertain

the relation of the gastric acid secretion to the alveolar CO_2 tension. These results were compared with those obtained by the Benedict-Fuld method. There is a rise in the CO_2 tension with increased gastric HCl secretion in the case of hyperacidity but not in conditions of anacidity. ARTHUR GROLLMAN

The internal secretion of the parathyroid and the possibility of its replacement; a contribution to the treatment of parathyroid tetany in man. F. BLUM. *Deut. med. Wochschr.* **52,** 1539–41(1926). ARTHUR GROLLMAN

Studies on gastric anacidity. C. S. KEEFER AND A. L. BLOOMFIELD. *J. Clin. Investigation (Proc.)* **2,** 607–8(1926).—Anacidity without gastric disease does not affect the vol. of gastric secretion. When assocd. with org. gastric disease, the vol. is reduced. ARTHUR GROLLMAN

Experimental accumulation of iron and cholesterol feeding in guinea pigs from the standpoint of the appearance of these substances in the palate. PAUL NEUDA. *Wiener med. Wochschr.* **76,** 722–4(1926).—Colloidal Fe_2O_3 was injected into guinea pigs and cholesterol fed by stomach tube and the accumulation of these substances in the palate noted. The histological picture of the liver after the Fe injection is also described. ARTHUR GROLLMAN

Secretory innervation of the kidney. M. AIAZZI MANCINI. *Rend. d. adunanze dell' accad. med.-fis. fiorentina; Sperimentale* **80,** 107–9(1926).—Atropine, injected into the abdominal vein of *Rana esculenta,* reduces the sugar output through the kidney perfused with Brömser's liquid, while pilocarpine causes an increase. A 30% increase over the normal amt. of Ca^{++} increases both the urine vol. and the sugar content. M. HEIDELBERGER

Relation of thymus to thymic syndrome. M. S. REUBEN AND H. R. FOX. *Arch. Pediatrics* **43,** 555–8(1926).—The existence of a thymic hormone is discussed. JOSEPH S. HEPBURN

Teeth and internal secretory glands. WILLIAM LINTZ. *Dental Cosmos* **68,** 943–9 (1926).—Review of the influence of the endocrines upon the development and pathology of the teeth. JOSEPH S. HEPBURN

Heat production of a nerve. H. C DOWNING, R. W. GERARD AND A. V. HILL. *Proc. Roy. Soc* (London) **100B,** 223-51(1926).—Expts. were made on the isolated frog nerve, using faradic stimulus The heat produced was expressed as cal. per g. of nerve per sec. of stimulation, and was approx 7.6×10^{-6} cal. during the initial phase, and approx. 6.9×10^{-5} cal. total heat production. Approx. 90% of the total heat was liberated after the stimulus was over, a small initial heat production being followed by a prolonged phase of heat production which lasted 9 to 11 min. The abs. values obtained agree with results based on O_2 consumption and CO_2 production owing to nerve activity. JOSEPH S. HEPBURN

Excretion of uric acid by the kidney. HANS GREMELS AND RICHARD BODO. *Proc. Roy Soc* (London) **100B,** 336–59(1926).—Injected uric acid is excreted by the isolated perfused kidney. The concn. of uric acid in the urine depends upon its concn. in the blood, and upon the rate of flow of the urine. Uric acid has a more or less pronounced diuretic action upon the isolated kidney and in the intact animal. The actual secretion of uric acid occurs in the tubular cells of the kidney. In the intact animal and in the heart-lung-liver-kidney-prepn., uric acid is mainly oxidized to allantoin in the liver, rather than excreted. JOSEPH S. HEPBURN

Influence of barometric pressure upon the gas metabolism of red blood cells. GYULA FÖRSTER. *Biochem. Z.* **169,** 93 9(1926).—The red cells of the blood of rabbits under 750–60 mm. Hg pressure consume 2.11 cc , but at 460 mm. 5.29 cc., O per 100 cc. blood per hr. This increased consumption of O occurs because young red cells are formed These new cells have a diam. greater than that of normal cells. W. D. L.

Proteolytic enzymes of the placenta. B. ARINSTEIN. *Biochem. Z.* **171,** 15–21 (1926).—The activities of pepsin and trypsin upon peptone from placenta and upon Wittes peptone were observed. There could not be demonstrated a tryptase which acts specifically upon placenta proteins. W. D L.

Changes in the quotient C:N in alkaline urines containing sugar as the result of decomposition processes. H. WADA. *Biochem. Z.* **171,** 210–6(1926).—In the collection of alk. urines contg. sugars, the urine must be kept cold to prevent the conversion of the sugars to non-reducing substances. W. D. L.

Studies in carbohydrate metabolism. IX. Continued investigations into the influence of insulin and muscle tissue on glucose in vitro. CHRISTEN LUNDSGAARD AND SVEND A. HOLBØLL. *J. Biol. Chem.* **70,** 71–7(1926); cf. *C. A.* **20,** 1843, 2337, 2360.—The active substance in muscle tissue does not convert $\alpha\beta$-glucose into a form which insulin can afterward change into *new-glucose* nor does insulin change it into a form

that can be converted into new-glucose by the active muscle substance. It has not been possible to show that insulin and the active muscle substance influence one another in such a way that one of them can convert $\alpha\beta$-glucose into new-glucose by itself. Therefore, the action of the two factors must be simultaneous within the period of the expt (2 hrs) It is proposed to call the active muscle substance "insulin complement." **X. Investigations into the occurrence of insulin complement in the muscles of warm-blooded and cold-blooded animals.** C LUNDSGAARD, S. A HOLBØLL AND ALFRED GOTTSCHALK. *Ibid* 79 82.—"The substance or principle (insulin complement) which has been demonstrated in the muscles of warm-blooded animals, which in conjunction with insulin is capable of converting $\alpha\beta$-glucose into new-glucose, has also been detected in the muscles of cold blooded animals (frog, cod, lobster) representing different classes of the animal kingdom. Unlike the insulin complement from the muscles of warm-blooded animals, that from cold-blooded animals is active at 20°. The expts show that the first step in carbohydrate metabolism is the same throughout the animal kingdom" **XI. Investigations into the occurrence of new-glucose in the course of the fermentation of $\alpha\beta$-glucose.** *Ibid* 83 7—"New-glucose cannot be detected during the fermentation of glucose by a variety of different methods It is, therefore, very improbable—although not finally settled -that the fermentation of glucose proceeds with new-glucose as a connecting link in the process The fermentation of glucose in its early stage is thus fundamentally different from the breaking down of glucose in the animal organism" **XII. Investigations into the properties of insulin complement.** *Ibid* 89-95.—Insulin complement cannot be removed from muscle by washing with H_2O nor can it be detected in the expressed juice of muscle, it must be assumed, therefore, to be combined with the intact cell stroma It is destroyed by heating to 70° for 2 min It is not identical with the muscle coenzyme demonstrated by Meyerhof (*C A*. **12**, 2092) A P LOTHROP

Amino acid catabolism. I. The fate of γ-aminobutyric acid and δ aminovaleric acid in the phlorhizinized dog. R. C. CORLEY. *J Biol Chem* **70**, 99 108(1926)—δ-Aminovaleric acid administered to a phlorhizinized dog does not give rise to glucose On the other hand γ-aminobutyric acid is a glucose former and is believed to yield 3 of its C atoms as glucose It is suggested that 1 of the paths of catabolism of the diamino acids is through the stage of the acids having 1 less C atom and with an amino group in the terminal position With acids with the amino group in the terminal position the path may be through the stage of the corresponding dicarboxylic acids A P. LOTHROP

The liberation of adsorbed substances from the proteins. II. The effect of addition of sodium oleate to whole blood upon the non-protein nitrogen in blood filtrates. S M ROSENTHAL *J Biol Chem* **70**, 129–33(1926), cf *C. A* **19**, 2847—Bile salts and Na oleate, because of their great affinity for proteins, associate themselves with the protein mols and tend to displace other substances which are less strongly attached to the proteins than themselves By the addn of Na oleate to the extent of 25 mg per cc of whole blood, it is possible to increase the non-protein N in the blood filtrates from 20 to 55%. This increase is due to the liberation of non-protein N-contg substances which ordinarily remain attached to the proteins and do not appear in the filtrates The nature of these substances is not yet known but it seems likely that the "rest N" of the blood (comprising approx 46% of the total non-protein N) may be chiefly involved in the increase of non-protein N in the filtrates which have been obtained A P. LOTHROP

The physiological significance of deamination in relation to glucose oxidation. H B SPEAKMAN. *J Biol Chem* **70**, 135 50(1926) —Expts were conducted with *B. granulobacter pectinovorum*, which produces Me_2CO and BuOH in media contg. utilizable carbohydrate, with the primary object of correlating more closely (*a*) vegetative growth of the cells, (*b*) oxidation of glucose and intermediate fatty acids, and (*c*) deamination of amino acids and the accumulation or utilization of the products. Deamination is an endocellular process and occurs mainly during the 2nd phase of the fermentation period, when the cells are passing into the spore form or disintegrating and the oxidation of glucose and intermediate fatty acids is most vigorous During this period the hydroxy acids formed from the amino acids accumulate in the medium, but none of the liberated NH_3 diffuses out from the cells In a medium contg. $NH_4H_2PO_4$ and $(NH_4)_2HPO_4$ without any other source of N, there was a marked stimulation of intracellular oxidation accompanied by simultaneous utilization of NH_3 The bacillus is also able to deaminate tyrosine and the oxidation of glucose is catalyzed thereby. S. proposes, therefore, "to ascribe to bacterial deamination an additional possible physiol function During the anaerobic respiration of carbohydrates and

fatty acids the rate of oxidation is stimulated, directly or indirectly, by a simultaneous deamination of amino acids within the cell. This effect is directly associated with the utilization of the liberated NH_3 and the hydroxy acids are secreted into the surrounding medium. The cycle through which the NH_3 passes and the precise mechanism by which its effects on oxidation is brought about is unknown " The possible bearing of these observations on the mechanism of carbohydrate utilization in the tissue cells of the animal body is discussed. A P. LOTHROP

The identification of acetaldehyde in normal blood and its quantitative study in the blood of normal and diabetic dogs. A. H. GEE AND I. L. CHAIKOFF. *J Biol. Chem* **70,** 151–65(1926) —MeCHO has been qual. demonstrated in ox blood by pptn of the insol compd., aldomedon, which it forms with 5,6-dimethyl-1,3-cyclohexanedione (dimedon), this was identified by means of its m. p. and by conversion into its anhydride. Detn. by oxidation to AcOH in the presence of Nessler's soln gave 2 to 6 mg per l as the MeCHO content of normal dog blood No significant increase in the blood was found to follow pancreatectomy. As the MeCHO content of urine has been found to be markedly increased in diabetes, attention must be directed to the kidneys for further information regarding the place of MeCHO in diabetes, since there is no corresponding increase in the blood. These results do not confirm those of Supniewski (*C A* **20,** 3742.) who found an excess of MeCHO in the blood of depancreatized dogs A. P. LOTHROP

The specific rotatory power of glucose-insulin solutions in contact with muscle tissue in vitro. H H BEARD AND VERNON JERSEY. *J. Biol Chem.* **70,** 167–71(1926).—The expts. of Lundsgaard and Holbøll have been repeated (*C. A* **19,** 834) and their results as to the production of new-glucose *in vitro* from glucose-insulin-muscle solns have not been confirmed The results obtained are in close agreement with those recently reported by Barbour (*C A.* **20,** 1101) and Paul (*C A* **20,** 2360) Variations of [α] from the usual value for glucose of 52 5° with glucose-insulin solns. are shown to be due to exptl error and were only slightly lower in any case With 4 and 6% glucose solns, the reducing and rotatory values and also [α] agree closely. A. P. L

The phosphorus content of human milk and cow milk. EJNAR LENSTRUP. *J Biol Chem* **70,** 193–202(1926) —Analyses of 15 samples of normal human milk and 15 of normal herd milk of cows gave the following av amts of P, resp , in mg per 100 cc of milk total 14 2, 95 4, acid-insol 2 6, 17 1; inorg. acid-sol. 5 1, 67.1; org. acid-sol. 6 5, 11.2 The acid-insol P was about 98 5% casein P with a trace of lipoid P. In herd milk weekly detns showed the same values for casein and acid-sol P throughout the year. Inorg P was lower during the 3 summer months when the animals were in pasture A. P. LOTHROP

Donnan equilibrium and osmotic pressure relationship between the cells and the serum. HSIEN WU *J. Biol Chem.* **70,** 203–5(1926).—"The approx osmotic equality between the cells and the serum is the result of a special condition obtaining in blood; namely, the impermeability of the cell membrane to the metallic cations as well as to the protein anions It is possible to distinguish between two kinds of Donnan equil , one in which only the 'collodial' ions of relatively low osmotic activity are indiffusible, and another in which also osmotically active 'crystalloid' ions, of the charge opposite to that of the colloid, are indiffusible In equilibria of the former kind equality of osmotic activity in the two phases is impossible (except at the isoelec point of a colloid with mols of zero osmotic activity) In equilibria of the latter kind, of which the blood is an example, the concns of ionic charges in the two phases are variable, but the total sum of charges in each is const., the variability in concn being caused by H_2O transfer In a system of this kind, as charges shift from osmotically inactive colloids to osmotically active crystalloid ions, H_2O can pass in either direction unaccompanied by electrolyte in such a manner as to maintain osmotic equality in the two phases " A. P. LOTHROP

Sea water as perfusion fluid for the isolated heart. S. W. ZIGANOW. *Biochem. Z.* **170,** 311–20(1926).—The sea water used in these expts. was obtained from the Black Sea near Odessa This water has the foll...

... water contracts normally, and remains alive for a long ... it becomes quiescent but still responds to mech. stimulation. S. MORGULIS

Studies on calcium of human serum. DI-FOUTSIN. *Biochem. Z.* **170,** 321–5 (1926).—In normal individuals the av. Ca of the blood serum was 11.7 mg. per 100 cc. Under the condition of prolonged body rest there is regularly observed a rise in the serum Ca, which on the av. was 14.3 mg or 22% higher . S. MORGULIS

Studies on blood coagulation. XIV. Effect of plasma proteins on the coagulation time. BERNHARD STUBER AND WILHELM EHRLICH. *Biochem. Z.* **170,** 355–76(1926); cf. *C. A.* **19,** 3108.—The addn. of globulin and fibrinogen to blood *in vitro* causes a marked slowing of coagulation. Similarly, blood coagulation expts. on rabbits and on healthy or sick persons show a parallelism between the coagulation time and plasma globulin (serum globulin + fibrinogen). Changes in the albumin–globulin ratio in favor of the latter increase the time necessary for coagulation *in vitro,* and vice versa.
S. MORGULIS

The alkali-binding power of blood serum in childhood. JOSEF CSAPO AND SAMUEL HENSZELMANN. *Biochem. Z.* **170,** 386–90(1926); cf. *C. A.* **20,** 69.—The alkali-binding capacity of serum due to its protein content was detd. as follows: A 0.1 *N* NaOH soln. is properly dild. to a 0.03 *N* concn., while in a parallel sample 2.5 cc. of H_2O are replaced with 2.5 cc. serum. The H-ion concn. of both samples is detd., and from this the OH-ion concn. calcd., this being less in the serum-contg. sample. The difference between these 2 detns. gives the amt. of alkali bound by the serum proteins. In healthy children 100 cc. serum can bind 730–910 cc. 0.01 *N* NaOH, or 95–110 cc. per g. serum protein. Correction being made for the alkali bound by $NaHCO_3$ (142 cc. 0.01 *N* per 100 cc. serum), the alkali binding capacity per g. protein is reduced to 77–90 cc., so that the largest part of the NaOH combines with the serum protein. In tuberculosis and pleuritis, likewise in lues, the alkali-binding power per g. serum protein is definitely below the normal range of values.
S. MORGULIS

Conditions favoring the autolytic ammonia formation in tissues. GEORG POPOVICIU. *Biochem. Z.* **170,** 395–409(1926).—Expts. with liver, spleen and muscle tissue demonstrate the importance of inorg. phosphate for the autolytic formation of NH_3, the H-ion concn. of the phosphate soln. being likewise very essential since the NH_3 production diminishes with increasing alky. of the soln. Lactate inhibits the NH_3 production indirectly, by preventing the hydrolysis of phosphate; hence, more NH_3 appears in alk. than in acid-lactate buffer mixts. Similarly, the relation between Ca, Na and K ions, and of diln., and the formation of NH_3 is explained on the basis of their effect on the phosphate. The depressing effect of glucose is partly attributed to the same factor as the lactate inhibition and partly to the glucose-phosphate combination.
S. MORGULIS

Experimental studies on the influence on the C:N ratio in urine of oral administration of acids, alkalies and of alkaline mineral waters from Neuenahr. MAKOTO WATANABE. *Biochem. Z.* **170,** 432–58(1926).—It has been found that standing for 24 hrs. at 18° has no noticeable effect either on the N or C, and therefore on the C:N ratio of sugar-free alk. rabbit urine. Following repeated administration by mouth of 0.004–0.010 g. HCl per kg. and per day results in an increased C:N ratio in the rabbit urine, while repeated daily administration of 0.01 g. Na_2CO_3, 0.008 g. NaOH or 0.007 g. $Ca(OH)_2$ per kg. of body wt. causes a lowering of the C:N quotient. Similarly, the administration of 11–40 cc. of Neuenahr spring water, or of 0.3–0.7 g. of salt from this mineral spring water, per kg. and per day, repeated for several days in succession, lowers the C:N quotient. After the administration of Neuenahr water to a sick dog a levorotary reducing substance disappeared from the urine, while in a human subject with mild diabetes the dextrorotation of the urine changed to a levorotation. In another mild diabetic it was found that even at a time when there was neither glucosuria nor ketonuria, and the diet was principally a fat-protein diet, the quotient C:N in the urine was pathologically high. The exptl. evidence obtained points to the conclusion that a high C:N quotient indicates a much poorer oxidation of C than of N, while a lowering of the quotient shows an improvement in the intermediate C metabolism. The evidence is: (1) the oxidation of C is affected by small amts. of acid which have no influence on the gaseous metabolism; (2) the improvement of C oxidation through small amts. of alkalies which also manifests itself in the gaseous metabolism; (3) the favorable therapeutic action of alk. mineral water in diabetes. S. M.

The bromine content of the organism. II. The physiological bromine content of organs. H. BERNHARDT AND H. UCKO. *Biochem. Z.* **170,** 459–65(1926); cf. *C. A.* **19,** 2965.—The hypophysis, adrenals and the wall of the aorta in both dogs and human subjects have the highest Br content. Br has been found in all organs in quantities ranging from 0.3 to 1.4 mg. per 100 g. of fresh tissue. But the hypophysis has 12.5 mg. (dog) and 15–30 mg. (man); adrenals, 3.3–5.0 (dog) and 1.4–1.8 (man); aorta 1.66–2.5 mg. (dog) and 2–2.5 mg. (man).
S. MORGULIS

Studies of the mineral metabolism of the skin. Calcium and potassium determinations in the skin of mice on an acid or basic diet. KAETHE BÖRNSTEIN. *Biochem. Z.* **172,** 133–40(1926).—Microchem. analyses for Ca and K were made on the skins of

mice which received either oats or a synthetic diet contg. McCollum's salt mixt. No. 185. Analyses of the foods used show that in the oats the ratio of cations to anions is 28:72; and in the synthetic food 65:35. In other words, one is definitely acid and the other strongly basic. The Ca and K content of the skin under these different diets showed no variation, so it seems unwarranted to regard the skin as a depot for these 2 cations. S. MORGULIS

The electrical factor in the formation of urine. R. KELLER AND J. GICKLHORN. *Biochem. Z.* **172,** 242–8(1926).—The kidney of vertebrates as well as the nephridia of lower organisms present a no. of localities characteristically charged with positive or negative electricity. The urine flows through these oppositely charged places. The glomerular membrane acts as an ultrafilter for the blood which flows through it and is under the mech. pressure exerted by the heart. The membrane probably becomes negatively charged under these circumstances. In frozen sections the glomerulus is relatively positive. The epithelium of the convoluted tubules is in the large mass charged strongly negative with positively charged granules. They reabsorb H_2O and salt (NaCl) by electroösmosis and expel the urea which migrates to the anode. The kidney is not merely the seat of electrostatic charges but presumably of continuous currents as well. S. MORGULIS

Experimental studies of the blood calcium. A. A. SCHMIDT AND G. D. OBRASTZOW. *Biochem. Z.* **172,** 262–71(1926).—Exptl. transplantation of bone tissue under the skin of rabbits causes a rise in the blood-Ca level of the host. The increase is much greater in homoplastic (+9%) than in heteroplastic (+4.1%) transplantations. It is suggested that the effect of the transplant upon the blood is not assocd. with a mobilization of Ca from the transplanted bone, since the Ca level remains high even 10 days after the surgical removal of the transplant. S. MORGULIS

The changes in the content of loosely bound carbon dioxide in the blood. H. TANGL. *Biochem. Z.* **172,** 355–7(1926).—See *C. A.* **20,** 441. S. MORGULIS

Resorption experiments on the surviving isolated intestine. III. The effect of saponin on the resorption of sugar solutions. FRITZ LASCH AND SIEGMUND BRÜGEL. *Biochem. Z* **172,** 422–7(1926); cf. *C. A.* **20,** 3493.—Saponin (Merck's purum albissimum) definitely increases the resorption of glucose solns. isotonic with the blood. The degree of resorption for about 100 min. during the expt. is directly proportional to the duration; then it commences to decrease. Without saponin 0.75–18% of the initial concn. of glucose disappears according to the length of the expt., whereas with saponin 14 53% (av.). These expts. lead to the conclusion that saponin does have a strong stimulating influence on resorption, similar to that exerted by strophanthin and digitonin on Ca. S. MORGULIS

The free sugar content of the white and of the yolk of the hen egg during its development. I. D. GADASKIN. *Biochem. Z.* **172,** 447–50(1926).—The fresh egg white contains 0.5% sugar. This diminishes until the 11th day of incubation when the sugar content is only 0.03%. From the 11th to the 17th incubation day (when the egg white completely disappears) no sugar is found. The egg yolk has less sugar, only 0.33%; it diminishes to 0.07% on the 11th day and then disappears entirely. The reserve yolk of the 3-day old chick is free from sugar. S. MORGULIS

The gaseous and energy metabolism of birds, and the influence upon it of the respiratory innervation (vagus nerve). PAUL BLOBELT. *Biochem. Z.* **172,** 451–66(1926).—In normal chickens the respiratory quotient in the fasting condition is 0.72; after 24–48 hrs. of inanition 0.706–0.719; and during digestion 0.898. The basal (resting) metabolism in the post-absorptive condition is 1351.7 cal. per sq. m. of body surface and 24 hrs.; in a state of inanition 1240.5–1259 2 cal.; and during digestion 1533.4 cal. One-sided vagotomy disturbs the breathing mechanism and causes a lowering of the energy exchange, but these changes are soon compensated by the intact vagus nerve. Double vagotomy causes immediately an even greater fall in metabolism, and it is of little consequence whether the operation is performed in a single step or the severing of the second vagus nerve is undertaken a long time after the first had been cut. In this case there is no tendency for the lowered metabolism to rise once more. The birds with the double vagotomy, because of the total paralysis of the gizzard, die ultimately of inanition. S. MORGULIS

Influence of bile acids on the protein metabolism of the sex glands and the significance of choleic acid. RICHIO KARASAWA. *J. Biochem.* (Japan) **6,** 139–59(1926).—Cholic and desoxycholic acids inhibit the proteolysis in autolyzing testes. The amt. of total N under these conditions is smaller than in autolysis without these added acids. It seems also that desoxycholic acid is more effective than the cholic acid in inhibiting autolysis. The inhibitory influence of the bile acids on the process of auto-

proteolysis depends upon the amt. as well as the concn. of these substances. The breaking up of the protein mol. in the autolysis of testes runs a peculiar course. Thus, the amt. of N from mono- and diamino acids becomes both absolutely and relatively smaller as the quantity of bile acid increases, while the cleavage of nucleoproteins is actually stimulated by them. This last fact is suggested as the reason for the increased uric-acid elimination in cases of obstructive icterus. S. MORGULIS

The phosphorus distribution in muscle and liver under different conditions, especially under the influence of hormones. YASUSADA ODA. *J. Biochem.* (Japan) **6,** 179-210(1926).—The expts. were made on male rabbits weighing 2-3 kg. which have fasted 48 hrs. before being subjected to the special exptl. treatment. Under the influence of insulin or pituitrin the water content of the muscles increases more or less, but it remains unchanged when both substances are administered together. The combined H_3PO_4 increases after the administration of insulin or glucose both in muscle and liver, but the simultaneous administration of both substances does not lead to a summation of the effect. Adrenaline and pituitrin, on the other hand, cause a diminution in the amt. of combined H_3PO_4 in muscles and liver. When adrenaline and pituitrin are administered together there is a definite antagonism in their action in muscle but in the liver there is neither antagonism nor synergism of their action. Insulin and adrenaline or insulin and pituitrin are antagonistic to each other from the point of view of their effect on the combined H_3PO_4, which holds true for muscle and liver tissue. The total P of muscle and liver increases under the influence of insulin and glucose, but simultaneous administration does not produce an additive effect. The curves of the autolytic splitting of P with the progress of autolysis are different for muscle and for liver. S. MORGULIS

Studies of the rate of sedimentation of red blood cells and the shifting in the plasma proteins in animals injected with India ink. SHIGEJI TSUNEKAWA. *J. Biochem.* (Japan) **6,** 237-60(1926).—Rabbits were injected with a prepn. of India ink of standard compn. (0.0587 g. N in 100 cc.). The fibrinogen of the blood was detd. by the method of Van Slyke and Ohta, the total protein and the albumin globulin ratio were detd. refractometrically according to Robertson, the sedimentation was studied by the procedure of Westergeen. The India ink was employed on account of its known hematopoietic function. Following an injection of the ink the fibrinogen content of the plasma increases suddenly and only after 7-10 days does it return to the normal level. The albumin globulin quotient diminishes and becomes normal again after a similar lapse of time. The globulin increases both absolutely and relatively but this increase is not always parallel to the changes in fibrinogen content. The rate of sedimentation of red cells is greatly increased after the India ink injection, this increase running parallel to the rise in fibrinogen. Morphologically, the injection causes a leucocytosis. S. MORGULIS

Studies on reversible hemolysis. KANSHI FUKUSHIMA. *J. Biochem.* (Japan) **6,** 315-22(1926).—The phenomenon of the return of the hemoglobin, set free from the stroma in hemolysis in hypotonic solns., back into the stroma takes place upon the addn. of hypertonic phosphate solns. but not of sucrose solns. The reversion of the hemolysis must therefore be attributed to the action of electrolytes which apparently combine with the hemoglobin and either penetrate into the stroma or else adhere to it. This reversion cannot be explained as being due to a shrinkage of the erythrocytes which were previously swollen through exposure to hypotonic solns. since the addn. of hypertonic sucrose soln. does not produce the same effect as the hypertonic phosphate soln. S. MORGULIS

A study of the carbon output during the first fast day. E. ADLERCREUTZ. *Skand. Arch. Physiol.* **48,** 129-137(1926).—Expts. were made on 3 healthy young men who during the preliminary and post-fasting period received a definite diet of known compn. The muscular activity during the fast and no-fast days was regulated by strictly adjusting the daily routine by the clock. The C output during the fast day was, on the av., 10.5% less than on the preliminary day. S. MORGULIS

The metabolism of ping-pong playing. H. BLOMBERG, G. JOHNSSON, A. KATAJAVUORI AND J. KIJANEN. *Skand. Arch. Physiol.* **48,** 231-3(1926).—The metabolism of ping-pong playing is 4.45 cal. per kg. and per hr., which is nearly equiv. to that assocd. with the work of joiners (3.34 cal.), painters (3.36 cal.), laundress (4.41 cal.) or stone cutter (5.73 cal.). S. MORGULIS

Labile sulfur in the blood. DAVID CAMPBELL AND E. M. K. GEILING. *J. Pharmacol.* **28,** 389-94(1926).—Very mild alk. treatment (boiling with 0.1 *N* Na_2CO_3 for 30 min. in an atm. of N) causes a considerable proportion of the S of whole blood, plasma and washed cells to be split off. This indicates that a large fraction of the S exists in a

very labile form. Attempts to isolate this S-contg. moiety by the employment of the ordinary protein-pptg. agents proved unsuccessful. These results indicate that there are substances in the blood, probably of a protein nature, which yield S as H_2S on very mild alk. hydrolysis. C. J West

Neutral salts in a high-tension field (KELLER, GICKLHORN) 2.

G—PATHOLOGY

H. GIDEON WELLS

Connection between lipolytic power and cholesterol content of blood serum in hypertonia. M. DORLE AND H. VON WEISS *Biochem. Z.* **167**, 395–400(1925) —The increased metabolism in diabetes causes the lipolytic power of the blood serum to be increased in spite of the decreasing effect of accompanying hypertonia In luetic patients, decreased lipolytic power accompanies decreased blood pressure In arteriosclerosis and essential hypertonia, lipolytic power is decreased or abolished, the cholesterol content being increased In arteriosclerotic hypertonia, the lipolytic power under the influence of I therapy is increased, whereas the cholesterol content decreases In those cases where I treatment fails and hypertonia remains, the cholesterol content increases and the lipolytic power decreases. B C. A.

Acid-base balance in pregnancy. O. H. GAEBLER AND G. L. ROSENE. *Proc Soc Exptl Biol. Med* **22**, 513–5(1925).—Twenty-three women were tested before and after delivery. The plasma CO_2 content was about 8.2 vol. % lower during pregnancy than afterwards. This was compensated for by a lowered concn. of bicarbonate in the blood as evidenced by the p_H of the plasma which remained practically unchanged. C. V B

The experimental production of a relative immunity to the cerebral manifestations of lead poisoning. C. V. WELLER. *Proc. Soc. Exptl. Biol. Med.* **23**, 36–7(1925) —White-lead poisoning caused epileptiform convulsions in rats If the rat recovered, larger doses were necessary to produce the cerebral manifestations. The immunity is restricted to the local effect No immunity to the general toxic effect of Pb is produced C. V. B.

The experimental production of lead gangrene in guinea pigs. C. V. WELLER *Proc Soc. Exptl Biol Med.* **23**, 37(1925).—Large amts. of white lead given to guinea pigs produced a dry gangrene of the ears The animals used were those which had developed an immunity to the convulsive action of the poison C V B.

The blood fibrin in canine anaphylaxis. E. W. SCHULTZ AND G NEWMAN. *Proc. Soc Exptl. Biol. Med.* **23**, 151–3(1925) —As a rule there is a well-marked decline in the fibrin values immediately after the drop in blood pressure. The decline is at first abrupt, then more gradual In animals which live sufficiently long, a gradual return towards normal values occurs The vol. of blood cells varies inversely with the fibrin This indicates that the drop in fibrin is due to an escape of plasma proteins incident to the increased permeability of the capillary endothelium recognized in anaphylaxis C. V B

The blood platelets in canine anaphylaxis. A. P. KRUEGER AND E. W. SCHULTZ *Proc. Soc. Exptl. Biol. Med.* **23**, 153–5(1925).—The blood platelets decreased 47% to 71% below the normal count, depending upon the extent of the shock. Two non-sensitized dogs injected with an equiv. amt of horse serum showed no change in the platelet count. C V. B

The circulation of blood sugar and the mechanism of diabetes. B. SYBRANDY *Nederland Tijdschr. Geneeskunde* **70**, I, 632–46(1926). —S. dets. the "glucometastasis," *i. e*, the transportation of sugar from the blood to the tissue, by comparieg the sugar content of blood drawn from the tip of the finger, with that of blood drawn from the vena cubiti In non-diabetic patients the former is higher, indicating the power of the muscle tissue to withhold a part of the sugar. In diabetic patients the opposite is frequently seen as the muscle gives off sugar to the blood, especially if glucose has been injected, or if bread has been fed. This is the chief cause of hyperglucemia. Incubating decreased the sugar content of blood in every instance In diabetic patients this decrease is smaller; this is attributed to an increased glucogenesis. The general glucolysis is not decreased in the diabetic patient, but, the glucolysis taking place in the pancreas has decreased (this form of glucolysis acts only following a rapid increase of blood sugar). With a normal or slightly increased blood sugar content the action of insulin is due chiefly to increased glucometastasis; with an increased blood sugar content its action is, in the first place, due to glucolysis. The action of an injection of 50 g. of glucose can be compared to the insulin action with normal blood

sugar; the action of a larger injection can be compared to an insulin action with higher blood sugar. R. BEUTNER

Cholesterol determinations in clinical work. S. BRANDES. *Nederland. Tijdschr. Geneeskunde* **70**, I, 650-7(1926).—The clinical value of cholesterol detns. in serum is doubtful, except in cases of pernicious anemia, which always exhibit a low value (0.95 to 1.25 per mille according to B.). R. BEUTNER

A case of levulosuria. I. SNAPPER, A GRÜNBAUM AND S. VAN CREVELD. *Nederland. Tijdschr. Geneeskunde* **70**, I, 1600-12(1926).—Description of a case of genuine levulosuria in a 17-year-old girl. The blood sugar content was not increased and did not rise even following the administration of fructose, no diabetic troubles were present. R BEUTNER

The blood sugar curve in mental disease. II. The schizophrenic (dementia praecox) groups. J. KASANIN *Arch Neurol Psychiatry* **16**, 414-9(1926).—The av. curve falls well within the normal limits, though the percentage of abnormal curves is higher than in healthy subjects. There is no curve characteristic of this condition. Patients in a stupor usually, but not always, give a high sustained curve. A. T. C.

Dietetic conditions which influence the calcium content of saliva. The possible significance of these facts in tuberculosis. C LEE PATTISON. *Brit. Med. J.* **1926**, II, 6-8.—A high saliva Ca can be produced by a diet contg. a large amt. of fat-sol. vitamin. A diet contg. even more Ca, but much cereal (especially oatmeal) and comparatively little fat-sol. vitamin, leads to a low saliva Ca. Increasing the diet-Ca over a short period does not increase the saliva Ca. Tuberculous children appear to have a lower saliva-Ca than normal; low resistance to the infection is accompanied by low saliva-Ca. The possible causal relationship requires further investigation. A T CAMERON

The gold treatment of tuberculosis. Second report of the Medical Research Council. *Brit. Med J* **1926**, II, 158-60. A summary of results with sanocrysin, indicating that extreme care is required in its use. A. T. CAMERON

Nephrosis of thyroid origin. J R DAVIDSON *Can Med Assoc. J.* **16**, 1059-63 (1926).—Chem and clinical details of 3 cases are given, the first nephrosis with mild hypothyroidism, greatly benefited by thyroid treatment, relapsing after cessation of thyroid, and finally apparently spontaneously cured, the second nephrosis with marked hypothyroidism and hypoparathyroidism, greatly benefited by administration of desiccated thyroid and Collip's ext. of parathyroid, but finally dying of intercurrent infection, and the third nephrosis, with hypothyroidism and apparent hyperparathyroidism, benefited by thyroid treatment. In the third case the basal metabolic rate rose above normal, and though thyroid was discontinued, the rise continued for some weeks, and was accompanied by a gain of wt. of 52 lbs., unaccompanied by any clinical sign of hypothyroidism or hyperthyroidism. A. T. CAMERON

A case of sub-parathyroid tetany treated with Collip's extract of parathyroid. J. R. MONTEITH AND A T. CAMERON *Can Med Assoc J* **16**, 1104-6(1926).—The tetany developing in a case in which the thyroid was removed for exophthalmic goiter was partially controlled by Ca lactate, and much more completely by Collip's ext. Serum Ca did not indicate any hypertrophy of remaining traces of parathyroid 82 days after operation, but within the subsequent 2 months (in which only Ca lactate was given) serum Ca returned to normal and the lactate was discontinued without any re-lowering of serum Ca or symptoms of tetany. A. T. CAMERON

The guanidine theory. A. T. CAMERON *Can Med Assoc J* **16**, 1117-9(1926). A. T. CAMERON

Normal and pathological spinal sugar. P FONTANEL AND A LEULIER. *J. physiol. path. gén* **24**, 262-70(1926).—Figures for the cerebrospinal sugar in normal subjects varied from 0.05 to 0.1%. Emotion doubtless had some influence on these results. In general the value is less than that of blood sugar. The oscillations depend on those of the blood sugar. As a rule physiological vasodilatation, pathological congestion, and local serous inflammatory exudation det. spinal hyperglucemia. The essential cause of a fall below normal is a marked leucocytic or microbian increase. Figures below 0.05 and above 0.1% have a pathological significance. A. T. C.

The clinical significance of the respiratory metabolic rate. E P POULTON, H. GARDINER-HILL, C. M. WILSON, R D LAWRENCE AND R HILTON. *Proc. Roy. Soc. Med.* **19**, Sect Med 29-36(1926).—A discussion. A T CAMERON

Pituitary glucosuria. P. J. CAMMIDGE. *Proc. Roy Soc. Med.* **19**, Sect. Med., 37-46(1926).—Although the secretion of the posterior lobe of the pituitary has no direct influence upon the storage or utilization of carbohydrate it may influence these processes indirectly by the property it possesses of forming a loose chem. complex

with insulin. Probably in a healthy individual this influence is mainly local, designed to protect the brain and nervous system from unchecked glycogen deposition. In the brains of rabbits dying after fatal doses of insulin an abnormally high % of glycogen was demonstrated. Pituitrin injections dil. the blood, possibly as a protective mechanism against high sugar content following the injection. Adrenaline, thyroid and feeding have no appreciable influence on the blood vol. Distinct and regular variations in blood vol., as indicated by changes in % hemoglobin after a meal, would seem to offer a means of diagnosing alterations in pituitary activity. Using such a test C. shows that pituitary disturbances not only enter into the pathology of many typical diabetics, but form the essential feature of a group of cases apparently related to acromegaly Pituitary glucosurics require dieting to give physiol rest to an overworked pancreas, but permanent reduction of carbohydrate to give a sugar-free urine is inadvisable. Insulin is only of temporary benefit in such cases, which are due simply to hyperactive pituitary function. A. T. Cameron

Hypoglucemia. O. Leyton. *Proc. Roy. Soc Med.* **19**, Sect. Med., 47–50(1926) — Chiefly clinical, dealing with various causes of unusually developing hypoglucemia (such as emotional disturbance leading to delayed food absorption) in diabetic patients under insulin treatment. A. T. Cameron

The chemistry of the cerebrospinal fluid in otitic meningitis. J. G. Greenfield *Proc. Roy Soc Med* **19**, Sect. Otology, 38–41(1926) – The diagnostic importance of Cl detn. is stressed, a fall towards blood plasma value indicating the probability of meningitis. A. T. Cameron

The tendency to acidosis in the toxemia of pregnancy; preliminary report. W. E Levy. *Surgery, Gynecol. Obstetrics* **43**, 38–9(1926) –The toxin of eclampsia produces definite destruction of liver lobules, which causes a derangement of carbohydrate metabolism and glycogen storage. Blood sugar and CO_2-combining power are lowered and a state of acidosis is either present or imminent. The rational treatment is with glucose and insulin. A. T. Cameron

The origin of malignant tumors. I. The lactic acid content of the tissues. R. Bierich. *Z. physiol. Chem.* **155**, 245–8(1926). -The hydrolytic processes in the border zone between tumor and adjacent tissue, which pave the way for further proliferation of the tumor cells, are promoted by the lactic acid which develops in the tumor and diffuses into the surrounding tissue. By comparing the residual lactic acid content of normal tissue with that of malignant tumors, it is found that the values for both groups vary within definite limits. The max values for normal tissue may even exceed the min. values for tumors, but the absolute limits for malignant tumors are about 100% higher than those for normal tissue Whether the high lactic content of tumors, leaving out of consideration the diffusion into the tissue and removal through the circulatory system, is due to increased sugar cleavage without inhibition of re-synthesis, or to a difference in activity of the 2 processes, remains to be detd. **II. The cytochrome of the tissues.** *Ibid* 249–50 – -Cytochrome, the respiratory pigment of both plant and animal tissues, is present in normal animal tissue, along with hemoglobin, in const amt., while in malignant tumors of one and the same organ it shows wide variations. These variations are not due to the time elapsed between excision of the tumor and spectroscopic examn., since no change was observed when the sample was kept 12 hrs. in an icebox. A. W. Dox

Tetanus toxin and its destruction. G. Wesenberg. *Z. angew. Chem.* **39**, 1004–6 (1926); cf. *C A.* **19**, 2854 —The bacteriology of tetanus and the various phenomena resulting from its toxin are discussed Exptl findings are also presented in tabulated form showing the relative destructive effect on the toxin by such substances as $KMnO_4$, Ca hypochlorite (caporit), *p*-$MeC_6H_4SO_2NClNa$ $(NH_4)_2S_2O_8$ and H_2O_2 $(CO[NH_2]_2 \cdot H_2O_2)$, their relative efficiency being in the order named W. O. E.

Nature of heterogeneous antigen. A. Sordelli, R. Wernicke and V. Deulofeu. *Rev. inst. bacteriol. Buenos Ayres* **4**, 15–21(1925); *Physiol. Abstracts* **10**, 307.—Heterogeneous antigen extd. from horse kidney is a lipoid with a soly. corresponding to that of the cerebrosides. Its soly. in ether is slight. H. G.

The utilization of carbohydrates in a case of chronic pentosuria. I. M. Rabinowitch. *J. Clin. Investigation* **2**, 457–61(1926).—Simultaneous blood sugar and respiratory quotient time curves were detd. in a case of chronic pentosuria after the ingestion of glucose. The results indicate no diminution in the sugar tolerance, nor any deviation from the normal metabolic condition. The utilization of carbohydrates in chronic pentosuria is, therefore, unimpaired. Arthur Grollman

Studies in blood volume. I. The blood volume in myxedema, with a comparison of plasma volume changes in myxedema and cardiac edema. Willard O. Thompson.

J. Clin. Investigation **2**, 477-520(1926).—In 9 patients with myxedema, the blood vol. was increased 25% on the administration of thyroid ext. A parallelism existed between basal metabolism and plasma vol. The plasma vol. changes in myxedema differ from those in cardiac edema in which condition plasma vol. increases with increasing edema. ARTHUR GROLLMAN

Guanidine excretion in relation to hypertension. C. P. HOWARD AND I. M. RABINOWITCH. *J. Clin. Investigation* **2**, 587-92(1926).—The av. daily excretion of dimethylguanidine in 13 cases of hypertension was 10.5 mg. The relation between arterial hypertension and decreased guanidine excretion is suggestive but in some individuals with marked hypertension normal amts. of guanidine bases are excreted. In one patient a fall in blood pressure was unaccompanied by any alteration in guanidine excretion. ARTHUR GROLLMAN

Changes in serum freezing point and in the concentration of serum electrolytes during lobar pneumonia. F. WM. SUNDERMAN, J. C. CARMACK AND J. H. AUSTIN. *J. Clin. Investigation (Proc.)* **2**, 603(1926).—Changes in the electrolyte and nonelectrolyte concns. of the blood serum in 22 cases of lobar pneumonia were followed through the febrile and afebrile periods by means of f. p., cond. and refractometric measurements supplemented with total base, Cl, CO_2, and certain nonelectrolyte detns. During active infection there was a decrease in the concn. of electrolytes in the serum and a proportional decrease in the f. p. depression. After the crisis the electrolytes resume their normal values while the f. p. depression increases above its normal. A. G.

"Nirvanol disease," an anaphylactic reaction similar to serum disease. BERNH. DE RUDDER. *Klin. Wochschr.* **5**, 1522-3(1926).—The daily application of Nirvanol in the treatment of chorea minor produces, after 9-12 days, an eruptive fever which closely resembles serum fever in its physical aspects and incubation time. A study of the blood and urine shows that this Nirvanol disease is associated with metabolic disturbances identical with those of serum fever. Nirvanol, a crystalloid, is, therefore, capable of acting as an antigen (perhaps indirectly). Repeated doses are necessary because, being a crystalloid, it does not remain in the circulation long enough to give a good antibody formation after one injection. MILTON HANKE

Potassium and calcium content of blood in circulatory diseases and the effect of exercise upon these values. FRANZ KISCH. *Klin. Wochschr.* **5**, 1555-7(1926).—The Ca and K content of blood is normal in circulatory diseases unless the diseases are associated with edema or with cardiac insufficiency. Edema is characterized by decidedly subnormal Ca values and cardiac insufficiency by a high K value. Exercise increases the K value of blood only in insufficiency cases. MILTON HANKE

Can the location of malignant tumors be determined serologically? KARL VOLKMANN. *Klin. Wochschr.* **5**, 1563-5(1926).—Not only can different tissues be sharply differentiated serologically, but histologically different portions of one tissue can be sharply differentiated, *e. g.*, portio vaginalis and corpus uteri. The exact location of tumors in this region is possible with the serological method. MILTON HANKE

Erythrocyte formula in the normal human being and its changes in experimental anemia. LORENZO CROSETTI. *Arch. sci. med.* **48**, 1-32(1925-6).—Diameters of 1000 red cells are measured and sizes plotted against % of total. Conditions of anemia cause a deviation in favor of larger forms. M. HEIDELBERGER

Changes in the serum which determine the Wassermann reaction. CARLO GAMNA AND GIUSEPPE ANDREI. *Arch. sci. med.* **48**, 33-42(1925-6).—Normal pigeons always reacted negatively. A pos. weak reaction occurred in birds injected intravenously with hog serum + lecithin or with hog serum + alc. ext. of homologous kidney, and not in the birds injected with lecithin alone. Hog serum alone caused almost as definite a deviation of complement. M. HEIDELBERGER

Lipases and colloidal peroxidases in the treatment of pulmonary and surgical tuberculosis. GIUSEPPE CAPPELLI. *Rend. adunanze dell' accad. med. fis. fiorentina; Sperimentale* **80**, 167-78(1926).—C. had previously shown that lipases destroyed the tubercle bacillus in sputum (*Giorn. Med. Milit.*, April, 1924). Calcified nodules from the lungs of patients dying of tuberculosis contained about 46% protein, 11% lipoids and 34% ash, of which 66% was Ca. The nodules are not attacked by lipase owing to their high content of free fatty acids. A guinea pig and a rabbit, infected with tuberculosis (expts. by Major Romby), and treated after symptoms were noted with injections of a mixture of lipase and peroxidase, recovered and remained well even after 1 yr. Brilliant results are claimed on hundreds of human cases treated similarly. Anaphylactic manifestations occurred in only 2 cases. M. HEIDELBERGER

Identification of lactic acid as an aid to the early diagnosis of malignant tumor of the stomach. GIUSEPPE CAPPELLI. *Rend. adunanze dell' accad. med. fis. fiorentina;*

Sperimentale **80,** 280–8(1926).—After extn. from the vomitus or gastric juice the most characteristic test is considered the decompn. on heating to 100° with H_2SO_4, according to MeCH(OH)COOH ⟶ MeCHO + CO + H_2O, with identification of the CO by the bluish color of the flame C.'s reagent (1% alc *p*-MeC_6H_4OH) may be used for detection of the AcH, giving an orange-red color. Other tests are given, but only the flame test is considered certain. M HEIDELBERGER

Changes in the blood and vessel walls in dystrophies of alimentary and nervous origin. BRUNO BENCINI. *Rend. adunanze dell' accad. med -fis fiorentina; Sperimentale* **80,** 316–9(1926).—Perfusion of normal guinea pigs produced an increase in wt. of 21 g., while in scorbutic animals the increase was 85 g , the edema probably arising at least in part from the actually observed lesions in the blood vessels M H

Chemistry of acidosis. C. A. KOCH. *Arch Pediatrics* **43,** 571–5(1926).—Review. JOSEPH S. HEPBURN

Further studies of the relation of Bacillus acidophilus to dental caries. R. W BUNTING, GAIL NICKERSON AND DOROTHY G. HARD. *Dental Cosmos* **68,** 931–42(1926) —Survey of 427 patients demonstrated a relation between the occurrence of dental caries and the presence of *B. acidophilus;* hence the disease is infective, and the bacillus is a specific bacterial etiological factor Cultures of the bacillus held in the mouth in contact with tooth surfaces may produce definite lesions of the tooth similar to those of dental caries The degree of decalcification produced is governed by the concn of the acids formed and by the character of the tooth Thorough prophylaxis and the use of *metaphen* may markedly reduce and even completely eradicate overgrowths of the bacillus upon the teeth, and tend to control and even stop the caries J. S. H

Application of blood chemistry findings to diagnosis and prescribing. T. H. McGAVACK *J. Am. Inst Homeopathy* **19,** 804 14, 894 907(1926) Review with bibliography JOSEPH S HEPBURN

Internal secretion, basal metabolism and transformation of protein in pregnancy. E KLAFTEN *Arch Gynakol.* **129,** 66–86(1926) -Exts of the hypophysis exert the same effect on the metabolism of pregnant and non-pregnant women Prepns of the anterior and posterior lobes of the hypophysis are antagonistic in action, the former decreasing and the latter increasing basal metabolism Thyroid ext increases basal metabolism much more in the pregnant than in the non-pregnant woman As protein metabolism has been found to be decreased in eclampsia these exptl. studies afford a basis for thyroid treatment when eclampsia is impending. Placental ext increases metabolism but ovarial ext has little or no effect In 10 women with extirpation of the uterus and ovaries or x-ray castration there was a decrease in basal metabolism. HARRIET F HOLMES

Comparative studies on the blood of the mother and child. K. VON OETTINGEN. *Arch Gynakol.* **129,** 115–45(1926) --The blood of the mother and of the new-born child show both chem and physico-chem differences In the blood of the new-born child there is a much greater amt of H_2O, P, Ca and a slight excess of Na, K and chlorides, a slight excess of residual N and urea N, no excess of uric acid and a marked excess of amino-acid N The maternal blood shows much greater lability than the blood of the new-born child, as shown in a no of tests, while the blood of a non-pregnant woman holds an intermediate position In the maternal blood the speed of sedimentation of the red blood cells is greater, and there is a greater amt of pptn in the plasma on heating, and after the addn. of $(NH_4)_2SO_4$, NaCl or alc The serum of the mother activates hemolysis of horse or sheep blood by cobra toxin, while the serum of the new-born activates the hemolysis only after heating to 100° The blood of the new-born shows a lack of hemolysins and agglutinins as compared to the blood of the mother. Evidence is contradictory with regard to the coagulability of the blood but it is generally held that coagulability is greater during pregnancy. Daboia poison increases the coagulability of blood of the mother but is without effect on the coagulability of the blood of the child. $CaCl_2$, however, increases the coagulability of the blood of the child over that of the mother. The red blood cells of the child are more resistant to cobra poison and hypotonic salt solns The blood of the child ppts. colloidal AgBr or collargol while the blood of the mother is without effect The findings with regard to surface tension, viscosity, cond and osmotic pressure are contradictory. HARRIET F HOLMES

The action of intramuscular milk injections on acute inflammatory processes and the resulting general and local cell reactions. W. BUTOMO *Arch. Gynäkol.* **129,** 171–85 (1926) —Studies in 35 gynecologic cases and expts. on animals indicate that intramuscular injection of milk causes a marked reaction of the bone marrow with a hastened ripening of leucocytes and a more rapid entrance of them into the blood stream. In

acute suppurative processes, which do not respond favorably to milk injections, the myeloid elements react in the same way as in normal animals, but with an increased intensity and the suppurative process becomes more acute. HARRIET F. HOLMES

Microscopic changes of certain anemias due to radioactivity. H. S. MARTLAND. *Arch. Path Lab. Med.* **2**, 465–72(1926).—A series of occupational poisonings due to the ingestion of radioactive substances, especially aged mesothorium, which occurred in the watch dial industry, has already been reported (*C. A* **20**, 1114). Radioactivity was demonstrated in the expired air by means of electrometers. Radioactive substances were demonstrated qualitatively and quantitatively by means of electroscopes and electrometers in the various organs of the body after death before and after chem extn., especially in the main storage organs of the reticulo-endothelial system, namely: the bones, spleen and liver In addn , the presence of radioactivity was further demonstrated by photographic methods. Shadowgrams of metal clips, etc., were obtained from the bones on dental film by exposure to β- and γ-rays coming from the bones. Photographs were also obtained directly on photographic plates by direct contact with the bones from α-, β- and γ-rays By means of an ingenious technic used by Lacassagne in his exptl. work with Po, autohistoradiographies were obtained from paraffin blocks of the bones after histologic sections were cut These demonstrated the uneven deposit of the radioactivity in the bone The anemias were all of the regenerative type from a morphologic standpoint resembling true pernicious anemia but with the difference that there is absence of evidence of hemolysis as shown by the absence of a hyperbilirubinemia and by very little hemosiderin deposits in the important organs. HARRIET F. HOLMES

The source of glycogen in tubercles. M PINNER *Arch. Path. Lab. Med.* **2**, 513–5(1926) —Glycogen appears in tubercles where leucocytes immigrate, it is found in epithelioid cells and in giant cells whenever they engulf leucocytes, and the occasional droplets of glycogen in these cells seem to be the remains of the digested leucocytes Small quantities of glycogen may be derived from digested bacilli as dried tubercle bacilli contain 4 1% of glycogen. HARRIET F. HOLMES

The site of formation and source of bilirubin. F. C. MANN. *Arch. Path. Lab. Med.* **2**, 516–27(1926).—While some bilirubin is undoubtedly formed in the liver the relative amt made in this organ as compared with the total amt. made in the whole body is insignificant. More bilirubin is formed in the spleen than in the liver. Most of the bilirubin is normally formed outside the liver and spleen The bone marrow is the most important site of formation of bilirubin When hemoglobin was injected into the arterial circulation of the spleen the bilirubin content of the blood in the splenic vein increased. Furthermore, another substance, probably hematin, appeared as an intermediary substance between hemoglobin and bilirubin. Evidently bilirubin is made from hemoglobin in the spleen HARRIET F. HOLMES

Prostaxia and the sero-diagnosis of cancer. R. FISCHER. *Néoplasmes* **4**, 129–44 (1925) —"Prostaxia" is the state of equil in which the globulin of the serum plays the role of a colloid protector towards the albumin of the serum This equil. breaks down in cancer and may be made the basis of a diagnostic test While the addn. of gelatin to normal serum renders the globulin less coagulable by alc.; in a cancer serum the globulin is more coagulable. Like other serum reactions for cancer, the reaction is not entirely specific, though most cancer sera give a positive, and most non-cancer sera a negative reaction In cancer serum the elec charges differ from those of normal serum and it is probable that prostaxia is dependent on a negative charge on the globulin. HARRIET F. HOLMES

Aluminum cancer. Preliminary note. R ODIER. *Néoplasmes* **4**, 145–7(1925).—Several cases of cancer of the stomach and esophagus developed a few months after the replacement of cooking utensils of Cu by those of Al HARRIET F. HOLMES

The influence of the medium on the activity of development of normal and neoplastic tissues in vitro. The action of the ions potassium and calcium. A.-H. ROFFO. *Néoplasmes* **4**, 148–53(1925).—Growth of both normal and neoplastic tissues is favored by the addn. of K to the Ringer soln and hindered by the addn. of Ca. It is probable that the effect on growth of these 2 ions is connected with an increase of radioactive action by K and a retardation by Ca HARRIET F. HOLMES

Cancer of the stomach. B. The content of the gastric juice in albumin. A. ROBIN. *Néoplasmes* **4**, 193–201(1925) —After a test meal the normal stomach content rarely contains albumin coagulable by heat. Coagulable albumin is frequently but not constantly present in cancer of the stomach and is also found in forms of dyspepsia and in ulcer of the stomach. There is probably a relation between ulceration of the cancer and the presence of coagulable albumin. HARRIET F. HOLMES

The electrical conductivity of normal and neoplastic tissue. A.-H. Roffo and H. Degiorgi. *Néoplasmes* **4**, 202–13(1925).—The sp. cond. of neoplastic tissue may be related to the higher content of neoplastic tissues in K and Na, and the lower content in Ca. Harriet F. Holmes

Cancerous ascites. A. Robin. *Néoplasmes* **4**, 257–63(1925).—A chem. study of the ascitic fluid from a case of cancer of the ovary, of atrophic cirrhosis of the liver and of syphilitic cirrhosis gave no findings applicable to a diagnostic test for cancer. Harriet F. Holmes

Studies on the content in protein substances and lipoids of neoplastic autolysates and filtrates after Citelli. P. Caliceti. *Néoplasmes* **4**, 287–304(1925).—A chem. study was made of neoplastic autolysates prepd. according to the method of Blumenthal and neoplastic filtrates after Citelli. The autolysates contained a greater amt. of total N, and of N-split products, particularly those related to the amino acids and peptones, and also a greater amt. of cholesterol Harriet F. Holmes

Radioactivity and its relation with normal and neoplastic tissues. A.-H. Roffo and J. C Landaburu *Néoplasmes* **4**, 327-35(1925).—Mice bearing tumors were injected with RbCl and the radioactivities of the tumor and various tissues and organs detd. by the electrometer. The radioactivity depended on the amt. of Rb injected but was always greatest in the neoplastic tissue. Harriet F. Holmes

The colloids in the serum of cancer patients and eosin. A.-H. Roffo and L.-M. Correa. *Néoplasmes* **5**, 12-6(1926).—Neoplastic tissue treated with an aq. soln. of basic eosin acquires a characteristic color due to the disappearance of fluorescence of the eosin. In rats the serum of animals bearing tumors also causes a loss of fluorescence of the eosin Human serum from cancer cases gave the reaction in 73% of the cases, which is about the percentage of positive results obtained in other sero-diagnostic tests for cancer in which lipoids play an important part. Harriet F. Holmes

Cytolysis in oncology. G.-C. Peracchia. *Néoplasmes* **5**, 44–60, 104-24(1926).—Human carcinoma and sarcoma cells, normal liver cells and animal carcinoma cells were treated with sera from cancer and non-cancer cases and the degree of cytolysis was detd by counting and refractometric methods. In general there was a marked decrease in cytolysis in the cancer cases, the epitheliomas showing fewer positive results than other cancers, as is the case with other sero-diagnostic tests for cancer. The findings agree better with the findings according to Botelho's reaction than with the Abderhalden reaction. The Abderhalden reaction while of high biologic importance is not specific for cancer. After irradiation with x-rays the return of the cytolytic power of the serum is more const. than after surgical excision of the cancer, when the lytic power remains weak and fluctuating. A review of sero-diagnostic tests for cancer and a long bibliography are given. Harriet F. Holmes

The chemical constitution of the albuminoid substances in cancerous tissue. A. Robin. *Néoplasmes* **5**, 65–72(1926).—While normal tissues contain approx. equal amts. of albumin and globulin, cancer tissue contains more albumin than globulin. Nucleoproteins are more abundant in cancer tissue than normal tissue, because of the large no. of cell nuclei present. However, other pathological tissues may contain an increased amt. of nucleoprotein. Cancer tissue contains a sp. albuminoid which is poor in S and very rich in hexone bases Harriet F. Holmes

A reaction diagnostic of cancer. A.-H. Roffo. *Néoplasmes* **5**, 73-5(1926).—A review of the various reactions proposed as diagnostic of cancer. H. F. H.

The precancerous phase. M. Sendrail. *Néoplasmes* **5**, 98–103(1926).—Chem. studies of the blood serum of animals painted with tar indicate general constitutional changes before the development of tar cancer. Hyperglucemia, hyperalbuminemia and hypercholesterolemia were noted. On the appearance of histological indications of malignancy there was a fall in cholesterol and lecithin and a rise in fatty acids. In the precancerous phase the p_H value is lowered and the reserve alky. decreased and this condition is accentuated as malignancy develops. The Ca content decreases as the first signs of malignant development appear. Tar cancer is less a cancer from irritation than a tissue expression of a general internal trouble. Harriet F. Holmes

Causes of cellular proliferation in general. Fundamental role of oxygen. Application to the problem of the genesis and of the nature of cancer. E. Busy. *Néoplasmes* **5**, 149–58(1926).—The amt. of free O supplied to a cell by the interstitial medium which bathes it is the cause of cellular proliferation. The cancerous cell is a cell, which by a long adaptation to new and persistent conditions of peroxidation of its surrounding medium, has activated its combustion and metabolism to the point where it has reacquired its embryonic character with all its physiol. properties of absorption, nutrition and proliferation. Harriet F. Holmes

Neutral red as an indicator in the processes of autolysis in normal and pathologic tissues. A.-H. Roffo. *Néoplasmes* **5**, 174–88(1926); cf. *C. A.* **20**, 2197.—Various tissues of the rat and also tumor tissue when subjected to autolysis with neutral red as an indicator give a gradation of color towards yellow in the following order: spleen, kidney, liver, muscle and tumor. This is probably an indication of the degree of autolysis, which is greatest in neoplastic tissue. The reaction is independent of the p_H value and is not modified by the addn. of lipoids. A similar reaction for human sera gave 98.4% positive results in cases with internal cancer, 100% negative results in non-cancer conditions and 33% positive results with cancer of the skin and mucous membrane of the mouth. This last class of cancers, fortunately easily recognized, is the same class that gives doubtful reactions with other biochem. tests for cancer.
Harriet F. Holmes

The enzymes of cancer tissue. A. Robin. *Néoplasmes* **5**, 193–210(1926).—The presence of a proteolytic enzyme in cancer tissue is indicated by an increase of sol. N which can come only from proteolysis. There is a decrease of catalase in the blood and in the tumor tissue of cancer patients. A decrease in the catalase of the blood, however, is not characteristic of cancer for there is also a decreased amt. of catalase in the blood in tuberculosis. Cancer tissue has lost all amylolytic and all lipolytic activity.
Harriet F. Holmes

Hypothesis on the origin of cancer. P. Lemay. *Néoplasmes* **5**, 226–32(1926).—The healing of a wound, like the formation of a cancer, is the result of the formation or activation of diastases, with consequent synthesis in the cells under the influence of trephones. Between the 2 processes there is only a question of degree. Trephones gain entrance to the cells through the lipoid membrane by traumatism or by the action of leucocytic lipase. The lipoids, representing the inhibiting power of the serum, are responsible for the formation and maintenance of this membrane. If the lipoids are deficient or the trephones too active or present in too great quantity, the formation of a cancer results.
Harriet F. Holmes

The water content of normal and pathologic tissues. J. Thomas. *Néoplasmes* **4**, 336–53(1925).—The H_2O content of the tissues varies with the species of animal and is greatest in the new born animal and diminishes with age. The tissues of lean animals show a greater proportion of H_2O than the tissues of fat animals. The H_2O content of various tissues varies with their physiol. activity. In many pathol. conditions the content of H_2O and solid matter decreases as the fat augments. Tumor tissue is richer in H_2O than normal tissue or non-cancerous pathologic tissue and rapidly growing neoplasms as a rule contain the most H_2O. Tumor fragments *in vitro* grow more rapidly after immersion in isotonic KCl, and less rapidly after immersion in $CaCl_2$. The tumor fragments subjected to $CaCl_2$ show a lessened H_2O content and a condensation of protoplasm. Different salts have a different action on the permeability of cellular membranes. The permeability of the cellular membrane, the chem. constitution of the protoplasm, changes in osmotic pressure within the cells and H_2O content of the cell are all closely related.
Harriet F. Holmes

The pathogenesis of lipoid nephrosis. Herman Elwyn. *Arch. Internal Med.* **38**, 346–59(1926).—Lipoid nephrosis is discussed from "the point of view of regulation in an effort on the part of the body to compensate for the loss of protein and to prevent a greater loss."
Mary Jacobsen

Complement deviation by sera of pregnant women and ultrafiltrates of placental autolyzates. P. Moretti. *Biochim. terap. sper.* **13**, 190–1(1926).—The serum of pregnant women consistently failed to cause complement deviation with the ultrafiltrate of a placental autolyzate, which consisted mainly of proteoses with a slight admixture of peptones and is believed closely to resemble in its compn. the autolyzate probably formed in the pregnant organism. Conclusion: the corresponding amboceptor is absent from the serum.
Mary Jacobsen

Auto- and iso-hemagglutinations in rabbits. M. Matsuda. *Japan Med. World* **6**, 4–8(1926).—Three blood groups are made for rabbits on the basis of 85 experimental animals.
N. Kopeloff

The relation of the cholesterol content of serum in hypertonicity and its power to hydrolyze fats. M. Dorle and H. v. Weiss. *Biochem. Z.* **167**, 395–400(1926).—The effect of sera of subjects with high blood pressures, upon tributyrin, as measured by changes in the surface tension of the soln. as hydrolysis proceeds are detd. W. D. L.

The production of conjugated glucuronic acid in depancreatized dogs. A. J. Quick. *J. Biol. Chem.* **70**, 59–69(1926).—Female dogs were rendered completely diabetic by depancreatization and after fasting 3–4 days were given borneol or BzONa. These animals produced glucuronic acid in amts. similar to those produced by normal dogs.

"The production of glucuronic acid is accompanied by a corresponding decrease in the urinary sugar, indicating that glucuronic acid and glucose have the same precursor; and that, when there is a demand on the organism for glucuronic acid, it is produced at the expense of the potential glucose. Since the glucose produced in total diabetes during fasting is generally believed to be solely derived from protein, it can be concluded that the diabetic organism can still utilize that portion of the protein mol which ordinarily goes to glucose for the synthesis of glucuronic acid." A. P LOTHROP

Studies on the mechanism of immunity phenomena. II. The effect of certain amino acids on the action of diphtheria toxin. B. SBARSKY AND L. SUBKOWA. *Biochem Z* **172**, 40-4(1926).—According to Sbarsky the antitoxic effect of quinine when mixed with diphtheria toxin, or when injected either before or after the toxin, is due to the fact that it is adsorbed by the red cells more readily than the toxin In searching for other substances which are adsorbed by the red cells it was found that *in vitro* red cells adsorb 28 8% of glycine and 25.7% of alanine, but neither leucine nor tyrosine is adsorbed The expts. were then tried with these amino acids *in vivo*, 1 unit of the min. lethal dose of diphtheria being injected into guinea pigs either alone or together with varying quantities of the amino acids. Both glycine and alanine prolonged the survival time while leucine has had no effect. Thus the *in vivo* effect was parallel to the *in vitro* findings on the adsorbability of these acids. However, tyrosine produced the most striking result, 0.1-0.05 g producing complete immunity to 1 unit of toxin, while even 0 01 g increased the survival time by 7 days. S. MORGULIS

Studies on diabetic lipemia. I. GUNNAR BLIX. *Acta med. Scand.* **64**, 142-74 (1926) —A study of the petr. ether fraction from the blood of 36 normal subjects (male and female) of the ages 17 to 42 years leads to the conclusion that in women the upper limit for neutral fat is 0 05% and in males 0 09%, while for the total fraction (neutral fat-free cholesterol) the upper limits are set at 0.14 and 0.16%. Of the various circumstances affecting the blood lipemia, arteriosclerosis is sometimes found assocd with an increase in free cholesterol but this is apparently not a common symptom Age does not seem to cause any change in the blood lipids, nor could there be any proof found of an influence of the climacterium on lipemia. In the few obese subjects examd there was variation from the normal in lipemia, though obesity of hypothyreodism origin probably leads to high blood fat values Dietary influences must, of course be taken into consideration, but the evidence of a hyperlipemia in normal fasting individuals seems uncertain. In one normal subject (a 20 year old woman) the petr. ether fraction of the blood has remained remarkably const. over a period of 15 days of fasting Expts. on 11 normal subjects receiving 0 6 to 1 4 g of fat per kg. in the form of butter or bacon fat (in 1 case pure olive oil) show that the neutral fat and the free cholesterol detd for 6 hrs. at hourly intervals after feeding do not change uniformly Whereas the neutral fat part of the petroleum ether fraction does increase (0.02-0.08%) the free cholesterol remains practically const in most cases. In several expts performed on 2 dogs receiving 40-50 g. of grease with their diet besides a large amt of meat and bread (after 24 hrs. fasting) a steady rise in the neutral fat of the blood has been observed which reaches a max. 2-4 hrs. after feeding, but the cholesterol remained practically const In 1 depancreatized dog the rise in neutral fat was very large and the max. value was reached after 6 hrs. Likewise in expts on 9 healthy, non-diabetic subjects a comparison of the blood fat in a fasting state and then 3-4 hrs. after breakfast and after dinner failed to demonstrate more than 0.02-0 03 g. variation above and below the normal lipid value per 100-cc. blood. In another group of 3 healthy individuals the Petrén high fat diabetic diet was tried, which produced an acidotic condition in all, but the fasting blood fat values with 1 exception remain within normal limits of variation, but they did show a marked post-absorptive hyperlipemia. **II.** *Ibid* 175-233.—Earlier observation that strong hyperlipemia is a rare symptom in diabetes, while moderate and slight degrees of hyperlipemia are not uncommon has been confirmed, a lipemia of 6.6% having been found in only 1 out of 49 cases examd. In 23 cases of diabetes the hyperlipemia did not exceed 1%. The hyperlipemia is much more common in the condition of active diabetes, and the hyperglucemia is regarded as a much more sensitive manifestation of diabetes than the hyperlipemia. In coma hyperlipemia was invariably found but this was of very variable intensity. Likewise in cases where coma was impending there were almost always cases of hyperlipemia. Considerable post-absorptive hyperlipemia was observed only in conditions of marked acidosis; in cases of mild and slight acidosis the blood fat was frequently normal. As a rule no close parallelism exists between the blood fat and blood sugar in the individual, but when under treatment the hyperglucemia recedes there is likewise a more rapid fall in the blood fat, and when the hyperglucemia becomes exaggerated there is also a rise

in the fat. The hyperlipemia is therefore not regarded as a sep. manifestation but a secondary phenomenon resulting from defective carbohydrate metabolism. The rapid disappearance of hyperlipemia has been often observed in patients taking 200–250 g. of fat daily. In 1 instance with an initial hyperlipemia of 6–7% this became nearly normal in a week and the hyperlipemia was entirely abolished in a month on this high fat diet. In patients on the Petrén diet for 4.5 years there has been no sign of overstrain of the fat-oxidizing mechanism. The production or maintenance of diabetic hyperlipemia appears to be quite independent of the food fat though a diabetic may respond to a sudden increase of fat in the diet with a transient rapid rise in the blood fat, and fasting in the active diabetic condition may likewise cause a transient susceptibility to food fat. The exact mechanism of the "susceptibility" to hyperlipemia is not understood, but it may share with the susceptibility to acidosis which also varies in different diabetics. It is indeed suggested that the variable susceptibility of patients to ketonuria and to alimentary hyperlipemia may antedate the development of the disease, as the same condition is even observed in normals on a diabetic diet. The course of the hyperlipemia in most of the observed patients suggests a close dependence of the hyperlipemia on the temporary degree of the defect of the carbohydrate metabolism, only in a single instance a marked independence of hyperlipemia from the direct manifestations of the disturbed carbohydrate metabolism having been noted. In insulin treatment a reduction of the hyperlipemia as well as of the other active symptoms was regularly found. As in the case of patients who do not receive the insulin treatment the reduction of the hyperlipemia took place very rapidly in some and much more slowly in others. In 2 coma cases the blood fat curve following insulin has been studied carefully for a no. of days, and it was found to run a course closely paralleling the oscillations of the blood sugar or blood CO_2-capacity curves. Only in very few instances did the insulin effect upon the blood fat last longer than on the blood sugar, and a clearly recognizable fall in the blood fat was observed 1 hr. after the insulin injection. III. *Ibid.* 234-50. The lipemia in mild and moderate cases of diabetes in patients under 50 years of age exhibits no peculiarities as compared to lipemia in the severe cases of diabetes. The active condition of diabetes may or may not bring on hyperlipemia, while in the inactive condition the blood fat of the diabetic is usually normal. In patients with mild or moderate diabetes and over 50 years of age some degree of hyperlipemia and hypercholesterolemia may exist which is independent of the active symptoms of the disease and are probably of different origin than the hyperlipemia in younger persons. A 1 or 2 day fast is followed in most cases by a decrease of hyperlipemia, the most marked fall occurring in the early hrs. of the day, and even where the blood fat did rise from morning to morning the blood fat did fall during the first 12 hrs. of the fasting day. The rise in the blood fat curve after ingestion in mild or moderate diabetics was not generally greater than that found in normal persons living on the diabetic diet, and sometimes not even as great as the rise in normal persons on their ordinary diet, and the alimentary hyperlipemia in the diabetics does not as a rule last longer than in normal individuals. There is therefore no relation between the degree of active diabetic symptoms and the magnitude of the post-absorptive rise in blood fat. Nor is there any relation between the mobility of the fat curve after fat ingestion and the level of the lipemia at the time. In a fasting condition in the morning there may be even a *fall* of the lipemia level after fat ingestion in spite of the initial hyperlipemia. Insulin has no effect on the post absorptive blood fat curve in diabetics. Furthermore, when a fatty meal is repeated several times during the day the alimentary hyperlipemia becomes gradually less and may even be absent ultimately. The ingestion of bread was followed by a distinct decrease in hyperlipemia in a no. of cases, while after the ingestion of meat the results are variable, the lipemia curve either rising, or falling, or even remaining unchanged. The explanation generally accepted that diabetic hyperlipemia is due to a slow rate of outflow of fat from the blood is flatly rejected. It is suggested that the diabetic hyperlipemia should be regarded as a regulative reaction, the mechanism of which, however, must be elucidated by research before any acceptable theory can be built up. S. M.

A study of the diazo urine. I. The chemical composition of the diazo urine in erculosis.

been made to identify the substance in the urine of tuberculous patients. A large amt., 50 l., from advanced tuberculous patients was condensed on the water bath to a thick sirup after preliminary acidification with a trace of AcOH, then pptd. with basic

Pb acetate until no more ppt. is formed. The filtrate together with the wash water was now evapd. under reduced pressure, the excess of Pb acetate removed with H_2S, the concd. filtrate made alk. with satd. $Ba(OH)_2$, the excess Ba removed with CO_2, and the final filtrate greatly concd. poured slowly into abs. alc. The ppt. was used to isolate oxyproteic and antoxyproteic acids while in the alc. filtrate hexone bases, histidine and various amino acids were studied. The following quantities of each were isolated and identified from the original 50 l. urine: antoxyproteic acid 67 33, oxyproteic acid 10.79, *l*-proline 0.15, aspartic acid 0.37, glutamic acid 0.024, serine 0 04, arginine 2.39, lysine 3.05 g.; the histidine and phenylalanine fractions merely gave pos. tests but could not be quantitatively estd. S. MORGULIS

Uremia and oxalemia. J. KHOURI. *J. pharm. chim.* [8] **3**, 374-7(1926).—The method of K. for detg. small quantities of *oxalic acid* (*A*) (*C. A.* **17**, 2544) is applied to *blood serum*. From at least 5 cc. of serum remove albumin with an equal vol. of 20% Cl_3CCO_2H, centrifuge and completely ppt. *A* from an aliquot part by addn. of 5-6 cc. of $PbO.Pb(AcO)_2$ (Codex) to each 10 cc. of albumin-free liquid. Centrifuge again, decant all liquid, and mix the ppt. with 4 cc. of 10% H_2SO_4 and again, after sepg. the soln., with 2 cc. of 10% H_2SO_4, unite the solns and ext. *A* with 3 or 4 × 2 vols. of Et_2O. After distg. off the Et_2O, add to the dried *A* 2 cc. of an alc. soln. of 1% urea, evap. till dry, and ext the residue with a total of 10 cc. hot AmOH, evap., dissolve the residue in H_2O and det. the uncombined urea with NaBrO. Oxalemia is an important factor in the complex uremic poisoning. In 10 severe cases of uremia, the urea content varied from 0.740 to 0.960 g. per l.; *A* was absent in 1 case, but in the others varied from 0 051 to as high as 0.600 g. per l. In 1 case, improvement was effected by reducing *A*, although the urea content remained nearly const. S. WALDBOTT

Nature of the toxin-antitoxin flocculation phenomenon. J. J. BRONFENBRENNER AND PHILIP REICHERT. *J. Exptl. Med.* **44**, 553-65(1926).—Animals immunized with the formalinized filtrates of young toxic cultures of *B. botulinus* produce an antitoxic serum poor in precipitins. Animals immunized with the formalinized filtrates of old or partly autolyzed toxic cultures produce an antitoxic serum contg. precipitins, while those immunized with toxin-free autolyzed bacteria produce a serum free from antitoxin but rich in sp. precipitins; those immunized with the filtrates or with the washed bacteria of an atoxic variant produce a serum free from antitoxin but rich in precipitins for the homologous toxin. Removal of the precipitin by flocculation with a non-toxic antigen does not materially reduce the antitoxic value of a serum; removal of the proteins of the antigen by acid coagulation removes the sp. precipitable substances. All the sera that contain precipitins produce the sp. flocculus when combined with homologous toxins, anatoxins or with the filtrates of the atoxic variant. The flocculation is restricted within the type. The amt. of the ppt and the width of the zone vary approx. with the estd amt. of bacterial protein in the antigen that is used for the immunization of animals. The toxin-antitoxin flocculation is considered a sp bacterial pptn. phenomenon. C. J WEST

Cause of "gulf" disease (BIGINELLI) 29.

H—PHARMACOLOGY

E. K. MARSHALL, JR.

Trypsin and insulin injections into the pancreatico-duodenal artery. T. E. FRIEDEMANN AND P. K WEBB. *Proc. Soc. Exptl. Biol. Med.* **23**, 69-72(1925) —The injection of solns. of trypsin, of insulin, and of NaCl into the pancreatico-duodenal artery of dogs under amytal anesthesia did not produce glucosuria or any marked increase in the blood sugar. The results are contrary to the findings of Epstein and his co-workers. C. V. B.

A striking cocaine-tyramine antagonism. M. L. TAINTER AND H. A. SHOEMAKER. *Proc. Soc. Exptl. Biol. Med.* 23, 157(1925).—In the dog, the cat and the rabbit, doses of cocaine which were so small that they did not affect the blood pressure, pulse, respiration or temp. augmented the blood pressure response to adrenaline, and prevented the blood pressure response to tyramine. The antityramine action seems to be specific for cocaine. It occurred in adrenalectomized cats. C. V. B.

The action of intestinal extracts. W. E. DIXON AND J. H. WADIA. *Brit. Med. J.* **1926**, I, 820.—Aq. boiled and filtered exts. of intestinal mucous membrane injected into rabbits produced a fall of blood sugar comparable to that produced by insulin. The active substance is destroyed by boiling with dil. acid and is therefore not secretin. Boiled and filtered exts. of pancreas and other tissues do not produce the effect. Insulin can be prepd. from the intestinal mucosa. Pituitary secretion following the

injection of intestinal ext is probably of the same nature as that which obtains after the injection of insulin A. T. CAMERON

Hypoglucemia due to insulin in children. G. A. HARRISON. *Brit. Med. J.* **1926,** II, 57–8.—Lower levels may be reached than in adults before symptoms are observable A T CAMERON

The thyroid and manganese treatment in acute pneumonia. H. W. NOTT. *Brit. Med J.* **1926,** II, 109–11; cf. *C. A.* **20,** 1272 —Further good results are quoted in cases of abnormal blood pressure, and markedly good results in numerous cases of acute pneumonia A T CAMERON

Goiter in children—a study of treatment. H D KITCHEN *Can. Med. Assoc. J.* **16,** 923–31(1926).—Desiccated thyroid, in safe doses (1 to 2 grains daily), produced a greater no of marked improvements and less failures than did I or expectant treatment. There were no cases of I hyperthyroidism as a result of use of I (Lugol's soln) Thyroid produced no untoward effects though given continuously for several months A T CAMERON

Newer drugs, their use and abuse. V E HENDERSON *Can Med Assoc J* **16,** 1077–82(1926).—A review A T CAMERON

Parkinsonism following carbon monoxide poisoning. R R GRINKER *J. Nerv Mental Dis* **64,** 16–28(1926) A T. CAMERON

The pharmacodynamic action of Japan camphor. L BOUISSET *J. physiol path gén* **24,** 254–61(1926) See *C A* **20,** 2206 A. T. CAMERON

Acriflavine in the treatment of chronic amebic dysentery. A J VAN DER SPUY. *J Roy. Army Med Corps* **46,** 121–9(1926) —Successful treatment in several cases A T CAMERON

Insulin-glucose treatment of shock. D FISHER *Surgery, Gynecol Obstetrics* **43,** 224–9(1926); cf *C A* **19,** 3114 Good results are obtained by using a sterile, 10–15% soln of glucose (500 to 2000 cc), 1 unit of I 20 insulin being given for each 3 g glucose A T CAMERON

The use of ethylene in obstetrics. A report of eighty-five cases. J KREISELMAN AND H F KANE *Surgery, Gynecol Obstetrics* **43,** 389–92(1926) – Excellent results were obtained A T CAMERON

The pathology of mustard gas burns and its relation to problems of prevention and treatment. H. S BLACKMORE *Proc Roy Soc Med* **19,** War Sect , 25–9(1926).—The delayed action of mustard gas is apparent rather than real Relative lipoid soly is an important factor in detg the vesicant power of any substance Mustard gas causes edema formation rapidly, with considerable cell destruction and capillary hemorrhage Systemic, as opposed to somatic life, appears to be necessary in order that mustard gas may be effective A. T CAMERON

An attempt to evaluate thyroid preparations, utilizing their effect on growth rate and production of organhypertrophy in the young white rat. A T CAMERON AND J CARMICHAEL *Trans Roy Soc Can* **20,** Sect V, 1–17(1926) —Direct comparisons of different dosages of the same thyroid prepn , averaging the relative effects on growth, liver, kidneys and heart, give results that conform to the equation $y = \log(10x + 1)$, where y is the observed effect (in terms of a standard dose) and x is the thyroid-I dose per kg body wt of the animal With this method of comparison, of 11 thyroid prepns tested 7 showed activity roughly proportional to I content, one was doubtfully higher, and 3 apparently definitely lower A T. CAMERON

Are insulin and hydrocyanic acid counteracting poisons? J. SZOLNOKI. *Deut med Wochschr.* **52,** 1127(1926) —Insulin is found to have a protective action against HCN poisoning in rabbits It is, therefore, suggested as an antidote in HCN poisoning ARTHUR GROLLMAN

Therapy by the whole alkaloids of belladonna leaves. JOHANNES WEGGEN *Deut med. Wochschr* **52,** 1429–30(1926). –The clinical action of *Bellafolin Sandoz*, a com. belladona-atropine prepn , is described ARTHUR GROLLMAN

A case of acute thallium poisoning in man with further observations on the clinical use of thallium. A BUSCHKE, BRUNO PEISER AND ERICH KLOPSTOCK. *Deut. med. Wochschr* **52,** 1550–2(1926) —A case of acute poisoning after drinking a $Tl(NO_3)_3$ soln. is reported The chief symptoms were marked alopecia, and nervous and digestive disturbances Tl is more toxic to adults than to children Its therapeutic value is discussed ARTHUR GROLLMAN

Experiences with arsenelectroferrol. A BERGER *Deut med Wochschr.* **52,** 1556–7(1926) - Clinical results of the treatment of anemia by the simultaneous administration of As, orally, and colloidal Fe, parenterally ARTHUR GROLLMAN

Clinical experiences with the new antigonorrheal remedy, Transargan. ERNST

THOMA. *Deut. med. Wochschr.* **52,** 1557-8(1926).—$Ag_2S_6O_9Na_4\ 2H_2O$, a cryst. Ag salt of definite chem structure, is preferred to the Ag prepns. commonly used in gonorrhea ARTHUR GROLLMAN

Dihydroxyacetone studies. I. Its respiratory and carbohydrate metabolism in normal men. E. H. MASON. *J. Clin. Investigation* **21,** 521-32(1926).—In normal men dihydroxyacetone given in 25- or 50-g. doses causes a more rapid carbohydrate metabolism than the same dose of glucose The blood sugar shows a smaller increment increase **II. Its respiratory and carbohydrate metabolism in diabetes mellitus.** *Ibid* 533-43. -The av max. increment increase of the nonprotein respiratory quotient after the ingestion of glucose by diabetics was 0.048 while after dihydroxyacetone it was 0.130. The total metabolism increased 11.2 and 19.6%, resp. A. G.

Gold therapy in tuberculosis. A. BAER. *Wiener med. Wochschr.* **76,** 691(1926).—The injection of triphal, a com. prepn of the Na salt of aurothiobenzimidozolecarboxylic acid, gave rise to a severe localized reaction, fever and cardiac and mental disturbances in several patients. ARTHUR GROLLMAN

Industrial injury of the skin by emetine. GALEWSKY. *Wiener med. Wochschr.* **76,** 857-8(1926) A chemist and several workers whose hands came in contact with emetine developed a severe dematitis. ARTHUR GROLLMAN

Pharmacology of the rare earths. M. AIAZZI MANCINI. *Rend. d. adunanze dell' accad. med fis fiorentina; Sperimentale* **80,** 118-20(1926) — A 3.2% soln of $LaCl_3$ is isotonic Concns up to 10% have no action on *Saccharomyces cerevisae;* 1.10,000 solns paralyze *Paramecium vivax* Injected into the dorsal lymph sac of *Rana esculenta* $LaCl_3$ soln. produces paresis and eventual death. Paralysis, not preceded by excitation, occurs in warm-blooded animals, the M. L. D. for white mice being 3.5 per 1000 body wt. The contractile activity of striped muscle is diminished. Very dil. solns stop the isolated heart. M. HEIDELBERGER

Chronic poisoning with thallium and ocular alterations. LODOVICO MAMOLI. *Sperimentale* **80,** 228 50(1926).—At the beginning of the intoxication in rats there was a transitory hyperglucemia, followed by a const. hypoglucemia Congenital eye lesions were absent, sexual changes occurred, and the bone lesions observed were not necessarily those of hypotrophic change Parathyroid lesions were generally lacking, and no interdependence was observed between alopecia, hypotrophic processes, bone lesions and appearance of cataract. Erythropenia and leucocytosis were observed. M HEIDELBERGER

Calcium lactophosphate in acetonemic vomiting. C. R. GREEN. *Arch. Pediatrics* **43,** 548 51(1926) Administration of Ca lactophosphate (2 grains 3 times daily) prevents attacks of cyclic or acetonemic vomiting. JOSEPH S. HEPBURN

Gelsemium sempervirens. THOMAS MITCHELL. *J. Am. Inst. Homeopathy* **19,** 707-13(1926) —When *Gelsemium sempervirens* was administered to rabbits and guinea pigs, it produced a marked generalized congestion of all organs, and exerted a severe toxic action on the liver, kidneys and testes, and a marked depressive action on the heart and respiration JOSEPH S. HEPBURN

Effects of beta rays from radium upon division and growth of cancer cells. J. C. MOTTRAM, G. M. SCOTT AND S RUSS. *Proc. Roy Soc* (London) **100B,** 326-35(1926).—The action of the beta rays of Ra upon Jensen's rat sarcoma is exerted upon the mitotic app. of the cell. JOSEPH S. HEPBURN

Immediate effects of tobacco smoke on rats. HAZEL E. FIELD. *Univ. California Pub. Physiol* **5,** 189-91(1926).—The rats were placed in an air-tight chamber of galvanized sheet steel through which smoke and air were drawn by a pump. Pennsylvania leaf tobacco was used. The period of exposure to smoke was 15 to 30 min. The immediate after-effect of smoking on the spontaneous activity of the rats was marked stimulation, the stimulation was apparent for 15 to 180 min. after smoking. JOSEPH S. HEPBURN

The effect of sanocrysin on B. tuberculosis. R. M. FRY. *Brit. J. Exptl. Path.* **7,** 174-6(1926).—In normal human or ox blood or plasma mixed with sanocrysin *in vitro,* concns. of sanocrysin up to 1 in 2500 had no effect upon the growth of the tubercle bacillus. Above this concn. the results are rather variable, but in some cases good growth was obtained in concns. up to 1 in 250, and in one case as high as 1 in 50. The bacillus grows as readily in the plasma of a tuberculous patient taken 10 min. or 2 days after a dose of 1 g. of sanocrysin as in the plasma drawn before the dose, or in normal human plasma. The bacillus grows as readily in the plasma of a rabbit after a dose of sanocrysin equiv. to 3 g. in a human being as in the plasma drawn before the injection. HARRIET F. HOLMES

The treatment of polycythemia vera (erythremia) **with phenylhydrazine.** G. E. BROWN AND H. Z GRIFFIN. *Arch. Internal Med* 38, 321-45(1926) - $PhNHNH_2.HCl$ was given by mouth in doses of 0.1 g 3 times daily, the total dose being 3.4-7.6 g. The av. amt. of hemoglobin destroyed by 1 g. per kg body wt was 6 g The destruction of erythrocytes is const and sp. and lasts from 7 to 10 days after the drug has been discontinued. The blood vol. is markedly reduced and leucocytosis specifically stimulated. There is striking symptomatic improvement, and no renal or hepatic injury.
M. J.

The pharmacology of dulcin. E. ROST AND A BRAUN. *Arb. Reichsgesundh.* 57, 212-20(1926) —Like all phenetedines dulcin in massive doses has a marked toxic effect on the central nervous system and a slight one on hemoglobin, especially in young animals The effect depends on the liberation of *p*-aminophenol and varies with species and individual Man may take 0.3-0.5 g daily (equiv to 125 g. sugar) in small doses during a longer period of time without any untoward effect M. J.

Relation between chemical constitution and therapeutic action. E. FOURNEAU *Compt. rend 6th conference intern chim* 1925, 72 211 —A review with extensive bibliography. Bactericidal agents are treated relatively briefly; by far the larger part is devoted to protozoöcidal and spirillicidal substances A complete monograph on the therapeutically tested derivs. of *benzenearsonic acid* constitutes $^1/_3$ of the paper. Of the metals only the org compds of *Hg* and *As* are discussed *Sb* and *Bi* are mentioned in the appendix. Vital staining is discussed in connection with germicidal action. A few general rules seem to be established Almost all triphenylmethane, diazine, thiazine, oxazine and acridine dyes, which have one or more NH_2 groups, are strongly germicidal The presence of alkyl groups in the nucleus reduces the bactericidal power; SO_3H and CO_2H abolish it almost entirely The reverse is the case for the protozoöcidal properties The bisazo dyes of the benzidine series are effective in trypanosomiases and have been systematically studied Tolidine is more effective than benzidine. The azo components of these dyes are differentiated in good and bad ones. All benzene derivs and those naphthalene derivs which lack an NH_2 or which do not have at least 2 SO_3H besides the NH_2 are bad groups Of the naphthylamines the α series are the less effective of the good group *H acid* is by far the best azo component Instances illustrating the influence of nature and position of substituents in both azo and diazo component are given The therapeutic properties are also largely detd by the position into which the diazo component enters on developing Bisazo dyes in which the $C_6H_4NH_2$ groups are sepd by a radical are less powerful than the benzidine derivs., CO being a relatively favorable radical The symmetrically substituted ureas to which germanin belongs show a peculiar dependence of therapeutic action on the sequence in which the components are linked together The following general conclusions can be drawn for the derivs of *benzenearsonic acid*. A *p*- and a *m*- NH_2 group have a detoxicating effect and increase the germicidal properties Substitution in *o*- is always extremely unfavorable. A further decrease in toxicity is effected by another NH_2 near the 1st one; but diamino derivs have only a very transient action because of their rapid elimination OH causes an even higher increase in parasiticidal power; the position is not of a dominating importance *p* is not the most favorable one; *o*- is bad if OH stands alone, but becomes favorable in the presence of a *p*-NH_2 The best results were obtained in small animals with *4-amino-3-hydroxybenzenearsinic acid* Acylation of the NH_2 in this compd. and in its isomers has always an unfavorable effect on the trypanosomicidal properties, while the spirillicidal power is hardly affected by acetylation. The influence of acetylation is also slight in the presence of a *p*-NH_2. In *atoxyl* the influence of the acylation of the NH_2 varies with the acid radical introduced. The neurotoxic action is considerably increased by HCO_2H and almost entirely abolished by aminobenzoic acid. The compds which have no effect on the nerves are listed. An account is given of F.'s work leading to his synthesis of *germanin*. M. J.

The influence of insulin on the acetaldehyde formation in the body of animals. J. V. SUPNIEWSKI. *J. Biol. Chem.* 70, 13-27(1926) —Insulin increases the formation of MeCHO in liver and muscle *in vitro* and this is more pronounced in the presence of fructose than with glucose. Injection of insulin along with glucose or fructose also increases the amt. of MeCHO in the liver and muscles and, in the case of fructose, in the blood. In the blood and urine of depancreatized animals there is an excess of MeCHO which insulin restores to a normal level. Administration of EtOH is followed by the appearance of excess of MeCHO in the blood and insulin accentuates this increase but also accelerates the return to normal. Only small quantities of MeCHO are excreted through the lungs and kidney after injection of moderate amts , indicating that most of it is being metabolized in the organism. Insulin seems to accelerate the disappearance

of blood MeCHO under these conditions. The expts. indicate that MeCHO is readily formed in the animal organism. A. P. LOTHROP

The reaction between acetylcholine and muscle cells. A. J. CLARK. *J. Physiol.* **61,** 530–46(1926).—The relation between the concn. of acetylcholine and the action produced on the isolated muscle of the frog can be expressed by the formula $Kx = y/(100 - y)$, where x = concn. of drug, y = action produced, expressed as maximal possible action and K = const. A reversible monomol. reaction probably occurs between the drug and some substance in the cell or on its surface. A demonstrable action may be produced on the heart when only 20,000 mols. per cell are fixed, an amt. that could occupy only a very small fraction of its surface. J. F. LYMAN

The antagonism of acetylcholine by atropine. A. J. CLARK. *J. Physiol.* **61,** 547–56(1926).—The action of acetylcholine and atropine on the heart, when both are present, can be expressed by the formula k (concn. acetylcholine) ÷ (concn. atropine) $= y/(100 - y)$, where y = action produced by acetylcholine expressed as % of the maximal possible action. The action on the Rectus abdominis muscle can be expressed as K (concn. acetylcholine) ÷ (concn. atropine) $^{1.5} = y/(100 - y)$. Atropine and acetylcholine appear to be attached to different receptors in the heart cells and their antagonism appears to be an antagonism of effects rather than combinations. J. F. LYMAN

The action of adrenaline given by mouth. A. BREMS. *Acta med. Scand.* **63,** 431–45(1926).—Adrenaline administered by mouth in sufficiently large doses (4 mg.) produces a distinct hyperglucemic effect. It also influences the blood pressure, but this side of the problem is still under investigation S. MORGULIS

The effect of adrenaline administered orally. A. BREMS. *Acta med. Scand.* **64,** 69–90(1926).—Adrenaline administered orally in 4-mg. doses produces a marked rise in blood sugar, but fails frequently to cause a rise in the blood pressure. Not infrequently it actually causes a drop in pressure. S. MORGULIS

The study of iodine as a biogenous element. I. B. BLEYER. *Biochem. Z.* **170,** 265–76(1926).—The I_2 content of various foodstuffs obtained from a goiterous subalpine region in Bavaria, together with the I_2 content of various soil samples and potable waters, is recorded. A critical examn. of the different analytical methods for detg. I_2 led to the selection of Fellenberg's procedure as the most reliable. **II. Feeding experiments on goats with increasing quantities of iodine.** H. NIKLAS, A. STROBEL AND K. SCHARRER. *Ibid* 277–99(1926).—The feeding of excessive amts. of I_2 had no influence on the behavior and health of the goats. The administration of 60–120 mg. per day and per animal produced no definite increase in the milk yield. The increase observed in the amt. of milk produced with the addn. of 60 mg. was only of short duration. On the contrary, 180 mg. per day caused a marked increase in the yield of milk. When 120 mg I_2 was fed per day, the abs quantity of fat in the milk was greater but the percentage of fat declined because of the larger milk yield. When 180 mg. I_2 was fed the abs. quantity of fat at first increased, then diminished again, but the percent of fat remained lower than before the I_2 feeding. The I_2 had no effect on body wt. or on sexual activity of the exptl. animals. **III. The chemistry of the animal iodine metabolism.** H. NIKLAS, J. SCHWAIBOLD AND K. SCHARRER. *Ibid* 300–10.—Inorg. I_2 given with food is quantitatively absorbed from the intestine. A long continued feeding with very large amts. of I_2 did not cause a lasting increase in I_2 content of the body fluids (expts. on goats and pigs). Daily feeding of 100 mg. I_2 produces an accumulation of I_2 in the body fluids of goats, especially the milk, reaching a level which can no longer be regarded as physiol. No deleterious effect on the animal's health was observed even under this condition. S. MORGULIS

Chemical alterations in the blood produced by narcosis. Does ether anesthesia cause an alkalosis? HELGI TÓMASSON. *Biochem. Z.* **170,** 330–6(1926).—Expts. with ether anesthesia on 2 healthy persons reveal a marked tendency toward alkalosis in the serum and a definite alteration in the Ca, K and Na to justify the statement that the isotony of the blood is disturbed. The rise of Ca is regular and appreciable. The K/Ca diminishes during anesthesia. S. MORGULIS

The effect of phlorhizin diabetes in dogs on the carbon-nitrogen ratio in the urine. TORAO KANANIORI. *Biochem. Z.* **170,** 410–31(1926).—In phlorhizin poisoning there is only rarely a pathologically increased elimination of dysoxidizable C through the urine, the C:N ratio, after the C present in the excreted reducing substances is deducted, being only exceptionally increased. The total N in the urine naturally affects the ratio C:N very definitely, but a higher or lower ratio is not necessarily assocd. with a larger or small N content. It also seems very probable that the value of the C:N

ratio is detd. to a certain extent by other C compds. in the urine than those where the C is in combination with N. S. MORGULIS

Effect of various drugs and of radiation on yeast. II. Demonstration of the influence of Röntgen rays on various substances by means of yeast. HEINRICH ZELLER. *Biochem. Z.* **172,** 105-25(1926); cf. *C. A.* **20,** 3308.—The influence of Röntgen rays on different substances is studied from the point of view of the behavior of radiated and non-radiated substance on the fermentative action of yeast (CO_2 production). The following are the different substances arranged according to the effect upon them of the x-rays. NaCl, various iodides in small doses, $MgSO_4$, KSCN, $AgNO_3$, Na lactate, Na glycerophosphate, Na urate, lecithin, urine and Witte peptone are unaffected by radiation in their influence upon yeast fermentation. The following substances manifest a brief influence of radiation, their stimulating or depressing action upon the yeast being temporarily increased: iodides in large doses, KBr, choline, hexamethylenetetramine, thyreoidin, egg yolk. The following is a list of substances whose effect (stimulating or inhibiting) upon the yeast is increased for a long period: $CuSO_4$, $K_2Cr_2O_7$, $KMnO_4$, NH_4Br, $(NH_4)_3PO_4$, KCN, $K_4Fe(CN)_6$, Na salicylate, cholesterol, nucleic acid salts, thiosinamine, hemoglobin, old lecithin, thyroid ext. Most of the active inorg. compds. are in the last group, so that their toxicity must be diminished through some internal rearrangement under radiation. With nitrogenous substances there is, apparently upon the N, a group which induces increased action but this matter requires still further study. This much is certain: there is no effect on Na, K, Mg, Cl, S, P and in case of I, except in large concn. It is also noteworthy that lactates are not affected, nor is lecithin. On the contrary, cholesterol, nucleic acid, thyreoidin, and hemoglobin undergo considerable alteration. S. MORGULIS

The circulation of gold in the sanocrysin treatment. SVEND LOMHOLT. *Biochem. Z.* **172,** 141-8(1926).—After intravenous injection of sanocrysin Au is regularly deposited in all organs, but in greatest amt. in the kidneys. The liver usually contains only 1/4 as much as the kidney. Heart and lungs retain only minimal quantities. In the intestine there is usually much Au deposited but the amt. is very variable. In the blood itself there are only traces of Au after 1 week. The Au is partly eliminated through the urine and partly through the feces, and, in the first week, in a ratio of 2:1. The elimination through the urine is very large during the first 24 hrs., and especially in the first few hrs. after the injection of sanocrysin. It then gradually diminishes, but persists for many months. The elimination in the feces is not as regular, and it may even increase for the first several days following the treatment. The distribution and the excretion of the Au are essentially similar to those of other heavy metals (Bi, Hg, Pb). The observations lead to the conclusion that sanocrysin produces toxic effects in the organism which are not unlike those caused by other heavy metals, and that there is, therefore, here the same danger of poisoning through the accumulation of the metal. S. MORGULIS

The influence of cations on the smooth muscles of the frog esophagus. W. WAGNER. *Biochem. Z.* **172,** 149-53(1926).—The exptl. results obtained with strips of the esophagus when the isotony is maintained by mixing NaCl, KCl and $CaCl_2$ in different proportions are recorded graphically by means of a triangular system of coördinates. The no. of exptl. points are sufficiently large to permit the prediction of the effect of any mixt. of Na, K and Ca ions from the diagram. S. MORGULIS

Further experiments on the influence of adsorption by charcoal on poisoning and detoxication. M. EISLER. *Biochem. Z.* **172,** 154-70(1926).—When charcoal adsorbs cholesterol its ability to adsorb saponin is greater than that of untreated charcoal under similar conditions, and its detoxicating power is accordingly enhanced. Likewise, charcoal loaded with saponin adsorbs somewhat more cholesterol than otherwise. The disinfecting power of phenol and sublimate, as regards cholera vibrios and typhus bacilli, is more or less reduced by the presence of charcoal, the degree of effectivenes depending upon the adsorbability of these substances. Thus, phenol is only partly adsorbed by the charcoal and its disinfecting action is little reduced, whereas $HgCl_2$ may be almost completely absorbed and thus its toxicity greatly diminished. When either phenol or $HgCl_2$ adsorbed to charcoal is employed for the disinfection of cholera or typhus bacilli, about 100 times as much disinfectant is required as when it is used in the free state. S. MORGULIS

The method of standardization of hypophyseal extract on dogs with urinary bladder fistula and the evaluation of results obtained by this procedure. HANS MOLITOR. *Biochem. Z.* **172,** 379-91(1926).—Most of the water administered by stomach tube to dogs with a urinary bladder fistula is eliminated in the first 2 hrs. The elimination in the 3rd hr. is on the av. only 9% when 250 cc. H_2O are given. It is, therefore, not

necessary to extend the expts. beyond 2 hrs. The curve of the H_2O excretion in both normal dogs and in dogs under the influence of pituitrin is not altered by the quantity of water administered. Const. results are obtained in expts. with 200 cc H_2O and a 2-hr. observation period. Even daily administration of hypophysis prepns. causes neither habituation nor a rise of the susceptibility of the dogs to this substance. The effect of hypophyseal exts. in small doses becomes most manifest after intralumbar injections in the shape of the 3-hr. diuresis curve. On the contrary, the strength of com. prepns is best evaluated from the total amt. of a 2-hr. inhibited diuresis The degree of inhibition of diuresis caused by very small quantities of hypophysis prepns differs greatly in different animals, but good checking results are obtained when the dose is sufficient to reduce the water diuresis to 25-30% of its normal level The strength of prepns of hypophysis can be essayed by the quantity which produces 80% inhibition of the normal water diuresis Such an "antidiuretic unit (A.-E.)" corresponds to 0.5 mg of Voegtlin's dry powder = 1 international unit. In this way a purely biological definition can be given to the international unit. S. MORGULIS

Studies in comparative biochemistry. III. The behavior of nicotinic acid in the organism of mammals and birds. YUTAKA KOMORI AND YUZO SENDJU. *J. Biochem.* (Japan) **6,** 163 70(1926); cf. *C. A.* **20,** 3496.—Dogs were fed 1 g nicotinic acid previously neutralized with Na_2CO_3 to obtain the sol salt. In the urine, part of the nicotinic acid was found unchanged Another substance was prepd. from the urine, m. 248°; on hydrolysis it yielded nicotinic acid and glycocol (nicotinuric acid). A third product found in the urine was trigonelline. In the rabbit, feeding nicotinic acid also gave rise to the glycocol combination, *i. e.*, nicotinuric acid, but the methylated product (trigonelline) does not appear in the urine. In birds, however, nicotinic acid is entirely eliminated as such without synthesis to nicotinuric acid as in rabbits, or to nicotinuric acid and to trigonelline in the dog. S MORGULIS

The behavior of *o*-nitrobenzaldehyde, *o*-aminobenzaldehyde and of anthranil in the animal organism. TAKESHI HOSODA. *J. Biochem.* (Japan) **6,** 171-7(1926).—*o*-Aminobenzaldehyde was administered to rabbits either by mouth in a water suspension or subcutaneously in alc soln , as much as 10 g. being given over a period of 9 days The urine collected from the animals did not show any reducing power, and gave neg. tests for indican and with *p*-nitrophenylhydrazine A substance was isolated from this urine which by its compn and m. p has been shown to be anthranilic acid. The yield of this was greater in expts with subcutaneous injections than in the feeding expts. Injections of *o*-nitrobenzaldehyde (10 g in the course of a week) likewise had no effect on the urine so far as its reducing power was concerned. *o*-Nitrobenzoic acid has been prepd. from the urines (2 g). In a third expt. anthranil in alc. soln was injected subcutaneously and showed no abnormal reactions against the fresh urine, but a substance was isolated from it identical with anthranilic acid S. MORGULIS

Experimental studies on the effect of parasympathetic poisons on blood sugar, with special reference to the problem of the parasympathetic hyperglucemia. TORAO SAKURAI. *J. Biochem* (Japan) **6,** 211 36(1926).—Subcutaneous injections of choline into fasting rabbits produce varying effects on the blood sugar depending upon the dose. Injections of 0 1 g per kg cause a slight rise in the blood sugar; a dose of 0.05 g. may cause either a small increase or a small decrease; while 0.01 g. per kg. produces a tendency to hypoglucemia A dose of 0 005 g. is ineffective. The effect is due to the choline and not merely to the exptl manipulation since injections of distd. water have no such influence on the blood sugar Oral administration of choline has no observable effects Eserine injected subcutaneously in doses of 0 1 mg. per kg. produces very uncertain results, but 1 mg. per kg. causes a definite hyperglucemia. Pilocarpine injected in doses of 5-10 mg. per kg calls forth marked hyperglucemia; with 2 mg doses the hyperglucemia is still recognizable while 1 mg doses show a tendency to produce hypoglucemia A smaller dose of pilocarpine (0 5 mg) has no appreciable effect. Finally, atropine in doses of 2-5 mg per kg. leaves the blood sugar practically unaltered. By simultaneous injection of eserine and atropine the hyperglucemic action of the former is inhibited; however, the atropine does not offset the poisonous effects of eserine, manifesting themselves in the shivering and cramps of the injected animals. This fact shows that the eserine hyperglucemia could not be attributed to either of these factors. Atropine likewise completely inhibits the hyperglucemic effect of pilocarpine. When 1 mg. eserine (hyperglucemic dose) is injected into rabbits together with 2 units insulin (hypoglucemic dose) there is only hypoglucemia produced, which is as great as in control expts. with insulin alone, and it follows therefore that eserine does not inhibit insulin but insulin completely inhibits the eserine effect. By simultaneous injections of insulin and pilocarpine there is likewise only hypoglucemia, but

its onset is slower than in the previous expt. In rabbits with both splanchnic severed neither pilocarpine nor diuretin produces a hyperglucemic condition, as this was noted in unoperated animals. Eserine, however, causes a slight rise in blood sugar even in the splanchnectomized rabbits, but not nearly as great as in normal animals. These observations lead to the conclusion that these drugs do not produce hyperglucemia through parasympathetic but through central stimulation. S. MORGULIS

Production of alcohol in the animal body. II. The amount of alcohol in the blood and liver of asphyxiated animals. MORIE AOKI. *J. Biochem.* (Japan) **6**, 307–14 (1926); cf. *C. A.* **19**, 3527.—In the blood of animals asphyxiated or poisoned with strychnine there has always been found an increased reducing power assocd. with hyperglucemia. But in addn. to this sugar there is also apparently a non-volatile reducing substance in increased amt. in the blood of asphyxiated animals, which in the case of the fowl used for these expts. is shown to be alc. The blood of fowls asphyxiated in various ways shows the presence of hyperalcoholemia as well as an increase in the alc. content of tissues. S. MORGULIS

Drugs from the Kamerun. I. Ebaeba, a remedy against thread worms of the natives. C. C. SANTESSON. *Skand. Arch. Physiol.* **48**, 316–25(1926).—The family of the plant from which the drug used in Kamerun against thread worms, the Ebaeba, is not known, but the drug consists of the rind of roots from a large tree, presumably of the Acanthaceae family. After the removal of the outside rind (cork layer) the inner rind of the root is ground and administered with a little water. The worms are quickly killed. The Ebaeba acts as a strong cathartic, and should be followed up with palm oil. The ext. obtained with boiling water is colored dark with $FeCl_3$, and gives a brownish ppt. Exts. made with alc. or with acidified alc. leave on evapn. a brownish residue which is an extremely powerful irritant. This residue was left in ether for 24 hrs., and the clear yellowish soln. filtered off from the insol. portion. On evapn. it yields a residue which when rubbed up with H_2O and injected into frogs did not seem to produce any toxic effects. On the contrary, the ether-insol. portion was dissolved in 95% alc. and then evapd. to dryness, and the residue made up into an emulsion with gum arabic. Injection of this emulsion into frogs was fatal. This fraction of the alc. ext. which is insol. in H_2O evidently contains the powerfully irritant substance which is regarded as a resinous material. S. MORGULIS

Toxicological properties of certain thiocarbamine compounds. J. V. SUPNIEWSKI. *J. Pharmacol.* **28**, 317–23(1926).—The toxicity of dithiopiperazine (I), thiohippuric acid (II) and its Et ester seems to be proportional to the quantity of S in their mols. The symptoms of intoxication are similar to those described after the injection of sulfides or colloidal S solns. or after the inhalation of H_2S. These compds. cause a depression of the central nervous system which leads very often to paralysis of the respiration which is the cause of the death of warm-blooded animals. The symptoms of intoxication develop very slowly, which may depend upon the slow absorption of these compds. from the subcutaneous tissues. The compds. are much more toxic when injected intravenously. The toxic dose of I decreases the blood sugar of animals, which seems to depend upon the general depression of the animal. The injection of a small dose of I or II causes a slight increase of the blood pressure. Toxic doses of these compds. decrease the blood pressure and depress the respiration of the animal; they also lower the vol. and slow the rate of the heart of the animal. C. J. WEST

[Effect of] temperature and adrenaline on the perfused frog heart. Relation of adrenaline response to temperature and rhythmic vigor. O. W. BARLOW AND TORALD SOLLMANN. *J. Pharmacol.* **28**, 325–39(1926); cf. *C. A.* **20**, 3045.—Pithed frogs exhibit summation of the increase of heart rate by adrenaline (I) and by temp. This indicates that the heat acceleration does not involve the sympathetic accelerator mechanism. Hearts that are naturally abnormally slow, for a given temp., show augmented summation between the natural heart rate and the I acceleration. Normally slow spontaneous heart rates, therefore, appear to be due to deficient rhythmic vigor of the heart muscle. Hearts with spontaneous rates faster than the av. for that temp. show complemental summation with I. Heat injury shows augmented summation with I injury. C. J. WEST

Some observations on the trypanocidal action of arsenicals. F. M. DURHAM, J. MARCHAL AND HAROLD KING. *J. Pharmacol.* **28**, 341–9(1926).—Expts. with aminotoluenesulfonylaminobenzenearsonic acid, its oxide and arseno deriv. show that the only activity is for the As_2O_3 *in vitro*. This substance at a diln. of 1:10,000 renders trypanosomes noninfective within 30 min. In the expts. *in vivo*, however, 5 mice of av. wt., 20 g., each received a max. dose of 0.3 mg. (0.015 mg. per g.), which corresponds to a concn. of As_2O_3 in the animal of 1:66,000 or in the circulating blood on intravenous

injection of about 1:3300, or 3 times as much as is effective *in vitro*. The oxide on injection must be rapidly rendered harmless by some body mechanism (doubtless the oxidative-reductive mechanism of the tissues). This action is probably complicated by the chem. reactivity of the arsenoxide grouping with reactive tissue groupings, which will probably delay the excretion of a part at least of the oxide. C. J. West

So-called habituation to "arsenic." Erich W. Schwartze and James C. Munch. *J Pharmacol.* **28,** 351–60(1926).—No certain habituation of cats to As_2O_3 fed in increasing doses at suitable intervals could be shown. The loss of appetite and slowness of eating which develop, or which cats voluntarily induce, complicate an analysis of the data. This enables the cats to retain more food than they would had the meal been eaten at once and a portion subsequently vomited. This "pseudo" tolerance is not regarded by the authors in any sense as a real tolerance. Cats fed daily doses of dissolved As_2O_3 in sub-emetic concn. developed no habituation; on the contrary they showed a decline in appetite. The failure of cats to withstand the threshold emetic dose successfully is a fair criterion of the improbability of developing any noteworthy systemic or gastro-intestinal habituation to As_2O_3 by feeding—the only manner in which habituation to As has been claimed to have been produced in man or lab. animals. C. J. West

Action of morphine in slowing the pulse. F. D. McCrea and W. J. Meek. *J. Pharmacol.* **28,** 361–6(1926).—After etherization and particularly decerebration the action of morphine in slowing the pulse is almost if not entirely abolished. This indicates that morphine in this particular case has exerted its action on the vagal center by way of the cerebrum. C. J. West

Some effects of quaternary ammonium compounds on the autonomic nervous system. Reid Hunt. *J. Pharmacol.* **28,** 367–88(1926).—The following approx. fatal doses (mg per g.) for mice (subcutaneous injection) are reported: Me_4NOH, 0.019; Et_4NOH, 0.107; Pr_4NOH, 0.052; Bu_4NOH, 0.019; $C_2H_3Me_3NOH$(neurine), 0.046; $C_3H_5Me_3NOH$(homoneurine), 0.13; $BuMe_3NOH$, 0.029; $PhMe_3NOH$, 0.049; $PhCH_2Me_3NOH$, 0.035; Bu_3MeNOH, 0.03; $BuEt_3NOH$, 0.071; $PhCH_2Et_3NOH$, 0.16; Bu_2Et_2NOH, 0.017; Bu_3EtNOH, 0.024; Pr_3BuNOH, 0.025. Typical "muscarine" effects were produced only by tri- and tetra-Me derivs. The most marked stimulating "nicotine" action upon the ganglion cells of the autonomic nervous system resulted from the Me compds. A paralyzing "nicotine" action resulted from a great variety of the alkyl onium compds.; it was not limited to the Me compds. as was the muscarine and marked stimulating "nicotine" action. None of these compds. seemed to have an atropine action in mammals. The fatal dose of Me_3SnOH is 0.0018 mg. per g.; it has no muscarine or atropine action. C. J. West

Blood fibrin and levulose tolerance in acute and chronic carbon tetrachloride intoxication. P. D. Lamson and Raymond Wing. *J. Pharmacol.* **28,** 399–408(1926).—A threshold dose of approx. 0.25 cc. of CCl_4 per kg. (by mouth) is necessary to produce a fall in blood fibrin. Larger doses (up to 6 cc. per kg.) cause no greater fall. Max. oral doses of EtOH alone produce no change in blood fibrin. The simultaneous administration of EtOH and CCl_4 does not reduce the threshold dose necessary to produce a fall in blood fibrin. CCl_4 administered orally in a single dose reduces levulose tolerance, the max. disturbance occurring about 3 days after administration and normal tolerance being reëstablished in 5–6 days. A single dose of CCl_4 produces in 48 hrs. a striking derangement of certain liver functions as shown by an increase in bile pigment in the blood, a reduced tolerance to levulose, a drop in blood fibrin and a disturbance of the phenoltetrachlorophthalein liver function test. Under the continued administration of CCl_4 the blood fibrin returns to normal in 2 weeks in spite of the very active liver lesions found. The sp. threshold oral doses of CCl_4 necessary to produce a change in the different liver functions are: decrease in blood fibrin, 0.25 cc. per kg.; pathological change, 0.5–1.0 cc.; retention of phenoltetrachlorophthalein, 4 cc. C. J. West

Effects of acetaldehyde, diethyl peroxide, ethyl mercaptan, ethyl sulfide, and several ketones—dimethyl, ethyl methyl and diethyl—when added to anesthetic ether. Wesley Bourne. *J. Pharmacol.* **28,** 409–32(1926).—AcH, when added up to 0.5% to anesthetic ether, does not produce any significant changes; with 1% there is marked respiratory embarrassment and consequent and concomitant effects on blood pressure; however, the animals recover well. Et_2O_2(0.5%) causes a decided lowering of the blood pressure and pronounced respiratory disturbance; 0.3% even after prolonged administration does not noticeably affect the animal. EtSH does not have much influence when present up to 1%. Et_2S in 1% concn. produces an extremely severe gastro-enteritis; with 0.3% or less, no such effect is caused and the blood pressure

and respiration are not altered. Et_2CO, MeEtCO and Me_2CO are apparently indifferent up to concns. of 5% C. J. West

Thrombocyte and erythrocyte changes produced by agents causing anaphylactoid reactions. Floyd De Eds and Vaughn Mitchell. *J Pharmacol* **28,** 433–49(1926).—The intravenous injection of various typical agents causing anaphylactoid reactions in guinea pigs (NaCl and Tyrode's solns , peptone, agar-sol gel, Congo red, collargol, charcoal, kaolin, colloidal As and Fe, 50% AcOH, tannic acid, histamine, $CuSO_4$, $BaSO_4$, etc) causes similar reactions in pigeons The reactions are accompanied by an increase in morphological forms resembling thrombocytes and a corresponding decrease in erythrocytes of the blood. Analogous changes in these cells occur on addn. of the agents to blood *in vitro.* The increase in thrombocytes appears to be the result of injury to erythrocytes from the direct contact with the various agents (may be the result of surface changes in the physical-chem. sense) C. J. West

Basis for the physiological activity of -onium compounds (Renshaw, Hotchkiss) **10.**

I—ZOÖLOGY

R. A GORTNER

Effect of certain drugs and dyes upon the growth of Endamoeba gingivalis (Gros) in vitro. Beatrice Fay Howitt. *Univ California Pub Zoology* **28,** 173–82(1926).—Study was made of the action of stovarsol, acetylarsan, sulfarsphenamine, neoarsphenamine, arsphenamine, neutralized arsphenamine, emetine-HCl, yatren, acriflavine, and gentian violet upon this ameba *in vitro* Stovarsol was the most effective, yatren the least effective The compds of As were more toxic than the non arsenicals Emetine-HCl was somewhat toxic but not a specific Gentian violet was tolerated in fairly strong concns Acriflavine apparently was as toxic as the arsenicals
Joseph S Hepburn

Experiments on extermination of flies with insect powder and similar substances. G Kunike *Desinfektion* **11,** 90 1(1926). Insect powder is effective M J.

A new type of luminescence in fishes. C F Hickling. *J Marine Biol Assoc* **14,** 495–507(1926) In the secretion of *Malacocephalus laevis* the luminiferous substances are present in granules, which behave as though each was bounded by a membrane whose permeabilities resemble those of a typical cell, but differ from cells in that they have little or no power of recovery from adverse conditions For optimal luminescence they require (1) a medium of a certain osmotic pressure, (2) a certain range of alky , (3) a certain range of temp , and (4) abundant O Sea water is not necessary for luminescence If they are exposed to extremes of acidity or alky , or of hypotonic or hypertonic solns , irreversible changes rapidly set in in the membrane of the granule, whereby the power of luminescence is lost In artificial conditions the rapid fading of the light from the initial brilliance is probably due to an increasing acidity caused by the accumulation of the products of oxidation N. Kopeloff

Results on an investigation of the "shining epithelium" and the iridescence of the Sapphirinidae, including remarks concerning the production of structure coloration due to guanine in other animals. W J. Schmidt *Biol. Zentr* **46,** 314 8(1926) —The iridescence of the Sapphirinidae is very closely associated with the polygonal cells of the dorsal hypodermis The shining platelets contain guanine, which can be identified by its soly in acid and alkali, its murexide reaction and crystallography These shining platelets possess a sort of submicroscopic lamellar structure It is interesting that guanine is associated in a similar manner with the iridescence and shining luster of other organisms, in *Pecten*, *Argyropelecus hemigymnus*, certain Amphibia and Reptilia.
Frances Krasnow

Actual reaction of tissue fluids in normal and in early metamorphosed frogs (Rana temporaria). B. W. Aleseiin *Biochem Z* **171,** 79 82(1926).—A change in p_H from 7.1 to about 6.6 occurs in the tissue fluid of tadpoles in metamorphosis. Conversely, this change is an indication that metamorphosis has occurred. W. D. L.

Chemical investigation of the metamorphosis of insects. III. J. Heller. *Biochem Z.* **169,** 208-34(1926), cf *C A* **20,** 2340 - The change in wt , the O consumption, and CO_2 evolution of insects in the pupa stage show that the chem. changes in the subitan and latent periods are similar W. D. L.

Chemical studies on the metamorphosis of insects. IV. Spinners and swarmers. Józef Heller *Biochem. Z.* **172,** 59-73(1926), cf. preceding abstr.—Caterpillars, pupae and freshly emerged butterflies of *Deilephila* were analyzed for fat, protein, ash and chitin; the analytical data for *Bombyx mori* were based upon Kellner's results.

The caloric values of the organism are detd. from these facts as well as the energy exchange. As a control, the metabolism has also been detd. from the O consumption. The results of this investigation show that during pupation, *Bombyx* utilizes chiefly fat, whereas the metabolism of *Deilephila* is non-fat. During the pupa period *Bombyx* supplies only $^1/_5$ of the energy metabolism through fat oxidation while *Deilephila* supplies nearly $^1/_2$ If little fat is used, the rest of the energy comes largely from protein, whereas if much fat is metabolized the rest of the energy is principally from carbohydrate. However, these differences disappear when the metabolism is studied for the entire metamorphosis The metabolism of metamorphosis, calcd. per unit of wt, is fairly const. for different insects The utilization of the caloric energy of larvae is different in the different species, depending upon the caloric value of excreted material Fifty % of the larva passes to the butterfly in *Bombyx*, but only 36% in *Deilephila*, because the latter loses 25% in spinning the cocoon, and this lower supply of combustible material is responsible for the briefer existence of the latter. **V. The metabolism of starving butterflies.** *Ibid* 74-81.—The compn. of imagoes of *Deilephila euphorbiae* which have just emerged and after a 12-day period of starvation shows that the butterflies have lost on the av. 58 7% in wt. The dry substance has diminished by 42 2%, and the water by 66.3%. The loss of H_2O is so great that the percent of dry substance in the organism of these fasting butterflies rises from 31.75 to 44.3, thus indicating an extensive desiccation of the tissues. The butterflies contain so little carbohydrate at the time of emergence that it plays a very small part in the total metabolism during the inanition (only 2 8% of total energy exchange), while practically 70% of the fat and 41% of the body protein are metabolized (these furnish 51.7 and 45 5% of the total energy, resp). S. MORGULIS

The effect of adrenaline and choline on the development of silk worms. G. FARKAS AND H. TANGL *Biochem. Z.* **172**, 350-4(1926). —Adrenaline shortens the time of development of silk worms; choline as well as a mixt. of choline and adrenaline causes a slight prolongation of the developmental period S. MORGULIS

Experiments on the effects of lead on the growth of plaice (Pleuronectes platessa). W. J DILLING, C W. HEALEY AND W. C. SMITH *Ann. Appl. Biol.* **13**, 168-76(1926).—The Pb ion in sea water does not retard the metamorphosis of plaice embryos. Colloidal Pb (1-250,000) does not kill, although it retards, the growth of young plaice. For gold fish, the min toxic concn of the Pb ion is 1-60,000. Death from the Pb ion may occur accompanied by respiratory distress and pptn. of protein on the gill filaments. C. H. R.

Influence of lead and the metallic ions of copper, zinc, thorium, beryllium, and thallium on the germination of frog's spawn and on the growth of tadpoles. W. J. DILLING AND C W. HEALEY. *Ann. Appl. Biol.* **13**, 177-88(1926).—Pb salts have a greater inhibitory influence on the germination of frog eggs than salts of the other metals tested, and also retard the growth of tadpoles in lower concn without causing early death Th salts inhibit germination of the eggs somewhat less than Pb and do not retard growth of the tadpoles. Zn salts do not inhibit development of the eggs, but are fatal to, or delay, growth of the tadpoles. Cu salts do not arrest development of the eggs, but are very toxic to the tadpoles, retarding growth in weak soln. Tl salts do not delay development of eggs but are toxic to tadpoles. Gl salts were relatively inert C. H. R.

Inhibition of animal luminescence by light. E. N. HARVEY. *Biol. Bull. Marine Biol. Lab.* **51**, 85 8(1926).—Inhibition of luminescence of photogenic material by light is not a general phenomenon. It is best observed in Ctenophores. Cypridine exts. are also inhibited if they contain O, and the inhibition seems to consist of an oxidative destruction of photogenic substance. **Oxygen and luminescence with a description of methods for removing oxygen from cells and fluids.** *Ibid* 89-97.—O is best removed from biol. fluids by the passing of H through the fluid after the addn. of platinized asbestos or colloidal Pt or Pd. Most luminous animals require free gaseous dissolved O for luminescence but a few can luminesce without such O. These are the Ctenophores, the medusa *Pelagia noctiluca* and Radiolarians. Pennatulids require O, as do all annelids, ophiurians, cephalopods, copepods and balanoglossids tested. In *Breoë* and *Pelagia* the photogenic granules (without cells) luminesce in absence of O, and it is suggested that the proper amt. of O is bound up in the photogenic granule, and cannot be removed by the methods described in this paper. L. W. RIGGS

Chemical sensitivity of the tarsi of certain muscid flies. D. E. MINNICH. *Biol. Bull. Marine Biol. Lab.* **51**, 166-78(1926).—The flies *Phormia regina* Meigen, *P. terrae-novae* R. D., and *Lucilia sericata* Meigen extend the proboscis upon appropriate contact of chem. stimulation of the tarsi. By means of these reactions it is shown that the

chemoreceptors in the tarsi serve as organs of taste. These chem. sense organs can distinguish water from paraffin oil or *M* sucrose soln., while similar chemoreceptors of the oral lobes are even more sensitive to *M* sucrose. L. W. RIGGS

Effects of changes in medium during different periods in the life history of Uroleptus mobilis. LOUISE H. GREGORY. *Biol. Bull. Marine Biol Lab.* **51,** 179–88(1926); cf. *C. A.* **19,** 1603.—Expts. with K and Na phosphates using series of different ages as well as the same series at different periods in its life history add further evidence to the theory of Calkins (*Biol. of the Protozoa*, Lea and Febiger) that changes are taking place in the derived organization of protoplasm of *U mobilis* throughout the life cycle L. W. RIGGS

Luminescence of Microscolex phosphoreus Doug. STANISLAW SKOWRON. *Biol. Bull. Marine Biol Lab* **51,** 199–207(1926) *M phosphoreus* is characterized by an external luminescence (except in the steady death glow) which begins upon stimulation All the properties of its light seem to show that this species has a luminescence of its own The luminous material is represented by small granules situated in the protoplasm of the cells, which take their origin from the body cavity. The luminescence begins probably after the granules are liberated from the cells L. W. RIGGS

Nutrition in aquatic animals. GILBERT RANSON *Compt. rend.* **182,** 1102–4 (1926).—Mollusks and many other marine animals absorb through the gills, feelers and mantle, as well as through the alimentary canal, the org food in soln in sea water. L. W. RIGGS

12 FOODS

F C BLANCK AND H. A. LEPPER

Detection of food adulterations by chemical means. E. CATTELAIN. *J. pharm. chim.* [8] **3,** 467 75, 511 20(1926) – A survey of recent food adulterations and methods of detection, since the treatise on this subject by Villiers, Collin and Fayolle (*C. A* **5,** 931, **7,** 524). A detailed bibliography is added. S WALDBOTT

Wheat and flour studies. VII. Milling and baking tests of frozen and non-frozen wheat harvested at various stages of maturity. W O. WHITCOMB AND PAUL F. SHARP. *Cereal Chemistry* **3,** 301 15(1926), cf *C A* **20,** 1284 --To study the effect of freezing as shown in the baked loaf, a dough was subjected to freezing temps Wheat was then soaked and dried until air dry at room temp.; aliquots were frozen and milling and baking tests were made Immature heads of wheat were frozen, and a comparison was made with other heads gathered at the same time but not frozen. After approx 1 year's storage other milling and baking tests were made on the same wheat samples. In all of these tests the authors interpret their results as indicating that the loaf vol. is not affected by freezing alone if they use as their standard for comparison the loaf which the same wheat, non-frosted, at the same stage of development would give, provided the wheat contained less than about 46% of moisture at the time of freezing, and provided that freezing in the field does not produce effects which were absent in their method of experimentation The effect of freezing in the field needs further investigation, especially in regard to its effect on the N compds. and carbohydrates. L. H. BAILEY

The colloid chemical properties of wheat gluten. A. KUHN AND GEORG RICHTER. *Kolloidchem Beihefte* **22,** 421–48(1926) -- The significance of the phys.-chem. properties of the gluten of a flour for its baking qualities is discussed. The best peptizing agent for gluten is 0 08 *N* $H_2C_2O_4$ since it gives the most viscous sols with convenient speed of peptization. The sols have a high temp coeff of viscosity in common with all solvated sols. Sols prepd at 20° age more rapidly than those prepd. at 50°. Gluten exts from 25-g. samples of various superfine flours sometimes exhibit greater viscosity than the exts. from baking flours from the same grain The official type of flour exhibits a decreasing gluten content with increasing fineness of milling, but the viscosity of the gluten sols does not run parallel The sensitiveness of different gluten sols to pressure seems to depend only upon the viscosity of the sol, becoming less with decreasing viscosity of the sol After-treatment of the sols obtained from 2 related but differently milled flours by diln with H_2O, $H_2C_2O_4$, KOH or NaCl solns. shows no new relationship in the viscosities The elastic properties of the glutens were investigated. The elastic sols come from the less highly milled and qualitatively better flours. The surface tension of the sols decreases with increasing degree of milling. F. L. B.

Leavening agents for self-rising flour. PAUL LOGUE AND IRENE T. RANKER.

Cereal Chemistry **3**, 335–40(1926).—Biscuits are chosen as the most representative bread chem. leavening agents being used. It was found that the proportions of leavening agents should be varied with different flours. It is recommended that the mill chemist, in the manuf. of self-rising flour, det. by comparative baking tests the proportion of leavening agents best suited to each flour. L. H. BAILEY

The determination of moisture in flour. A review of recent work. C. B. MORISON. *Cereal Chemistry* **3**, 323–34(1926).—Colloids will not part with all their water when subjected to air-drying temps. of 100–110°, or to exposure over dehydrating agents at ordinary temps. and pressures. The vapor pressure continually decreases with the removal of water until the system reaches such a low vapor pressure that water is no longer obtained, although considerable may be present. At the present stage in the study of the moisture detns., it is generally agreed that the problem is to establish a method which will express moisture percentage in the wt. of a flour sample (obtained from some accurate method of sampling) by drying under standardized conditions clearly defined on the basis of comparative and coöperative work. Reference is made to the several methods of drying flour which have been proposed in recent years, and comment is made on the merits of these different methods. Literature references on the subject which have been published in the last eight years are cited. L. H. B.

Plasticity—its possibilities in cereal research. J. A. DUNN. *Cereal Chemistry* **3**, 351–9(1926).—This paper contains a theoretical discussion of plasticity. As regards the practical application of plasticity values to flour manuf., too few data are available at the present time to enable one to say whether or not there will be correlation between the baking value of a flour and its plastic values. Plasticity detn. is proving of value in other industries which have plastic material to deal with, such as the rubber and paint industries, and it may prove of value in measuring "gluten quality." L. H. BAILEY

Should flour be artificially matured and decolorized? M. JAVILLIER. *Cereal Chemistry* **3**, 359–60(1926).—See *C. A.* **20**, 784. L. H. BAILEY

Factors affecting the diastatic activity of wheat flour. C. E. MANGELS. *Cereal Chemistry* **3**, 316–22(1926).—The 3 principal factors studied are (1) variety, (2) climate or rainfall and (3) soil fertility or cropping systems. Kubanka durum showed distinctly higher diastatic properties than other wheats examd. and Kota wheat was intermediate between Kubanka and the other spring varieties. Marquis wheat produced at different points in North Dakota showed variation in diastatic properties, and data indicated that low diastatic activity may be associated with low rainfall. Ceres wheat produced on rotation and fertility plots at Fargo, N. Dakota, showed variation in diastatic activity due to different cropping systems and fertilizers added. The variation in diastatic activity of flour appears to be due in large part to the susceptibility of the starch granule to diastase attack rather than to the concn. of diastase present. L. H. BAILEY

Investigations on the digestibility of wheat bread and rye bread from flour of different grades of milling. R. O. NEUMANN. *Arb. Reichsgesundh.* **57**, 1–23(1926).—A complete analysis and a calcd. calorific value of each grade of flour are given. The amt. of protein, fat, crude fiber and ash increases with the grade of both wheat and rye, while the carbohydrates decrease. The excretion of crude fiber, ash, carbohydrates and N for both wheat and rye increased with the milling grade of the flour; this is due to the increasing content of cell membrane. The digestion of the dry substance showed 2.5% better for wheat on an av. The metabolic loss of protein had its min. at 70% milled flour, being 12.93 and 23.9%, and its max. at 100% milled flour, being 25.57 and 40.5% for wheat and rye, resp. The difference in digestibility was 13% on an av. in favor of wheat. Of the carbohydrates 90% were digested at 100% flour and 98% at 70% flour, wheat exceeding rye with 1–2%. The loss of crude fiber was 64.44–86.31% for wheat and 65.34–87.07% for rye, the most favorable case being 35.56 and 34.66% digestion, resp. From $^1/_5$ to $^1/_3$ of the amt. of ash was found in the feces at 70% flour and more than $^1/_2$ the amt. at 100% flour; thus, the widespread opinion, that the salts in bread from higher milling grades of flour should be especially favorable as "nutrient salts" for the body, does not hold. The loss of ash was somewhat less for wheat than for rye. The utilization of the supplied calories by these expts. also decreased with the milling grade of the flour and was max. at 95%, min. at 87%, wheat exceeding rye with 1–2%. Wheat bread exhibits in all cases a better digestibility than rye. D. THUESEN

Casein content of Danish milk. H. M. HØYBERG. *Z. Fleisch u. Milchhyg.* **35**, 381–3(1925).—The av. ratio of casein to the other protein in the milk was found to be approx. 76 to 24%. This ratio is lower than that found by Fleischman (85 to

15) for milk from Germany. Casein fluctuated between 1.80 and 3.17% in the milk in the vicinity of Copenhagan. H. F. ZOLLER

Milk powder as food. II. Observations on the existence of vitamin E. L. T. ANDEREGG AND V. E. NELSON. *Ind Eng Chem.* **18,** 620–2(1926); cf. *C. A.* **19,** 2067.—Desiccated skimmed milk-powder, diets heretofore considered inadequate to produce reproduction, *i. e.*, lacking in E, were found to be potent in that respect when H_2O was added. When cod-liver oil is incorporated in skimmed milk-powder diets it undergoes decompn., giving rise to products suggesting acrolein. Addn of EtOH, wheat oil, or H_2O exerts a protective action on the potency of the diet. L. D. ELLIOTT

A new reagent for the detection of peroxidase in milk. P. BORINSKI. *Z. angew. Chem.* **39,** 281–3(1926).—Many previous easily oxidized substances used for detecting raw milk have proven unsatisfactory. Guaiacum resin has often been used but has been so exceedingly uncertain and erratic as to be very unsatisfactory. Yet a simple and rapid test is essential to rapid testing by workers not especially trained in lab. procedure. It was found possible to prep. the reagent quickly and so that it was stable at least for 8 days. 0.85 parts of guaiacum resin were finely cut up and dissolved in 85 parts of 70% EtOH with shaking during 0.5–1.0 hr. To this soln., 10 cc. of dil. C_6H_5OH soln. were added, and 5 cc. of 3% H_2O_2. Ten drops of this added to 5 cc. of raw milk gave a deep blue color, lasting 20–30 min. at 70° or lower, but only 2 min. at 75°, and less than 1 min. at 85°. It was therefore a very satisfactory test of pasteurized milk. One part of raw milk in 10 parts of pasteurized milk could be detected. M. A. YOUTZ

Effect of heating on the hydrogen-ion concentration and on the titratable acidity of milk. E. O. WHITTIER AND ANNE G. BENTON. *J. Dairy Sci.* **9,** 481–8(1926).—Skim milk was heated at 95° and at boiling for 14–16 hrs. Successive detns. were made by (I) titrating with 0.1 *N* NaOH to a p_H end point of 8, and (II) making measurements of c_H by electrometric methods. Values for I decrease at the beginning of the heating period and then continually increase. Values for II increase from the beginning until the casein begins to ppt. out when there is a sharp decrease. The rate of change is more rapid at the higher temp. FRANK E. RICE

Electrical pasteurization of milk. E. C. VAN LEERSUM. *Nederland Tijdschr. Geneeskunde* **70,** II, 234–45(1926).—Beattie and Lewis (*Med. Research Committee Special Reports,* No. 49) have sterilized milk by means of a high voltage a. c., using Cu electrodes. L. finds that the vitamin C is destroyed in this method but, if he replaces the Cu electrodes by C electrodes, *no such decompn.* takes place; the sterilizing effect is quite as satisfactory as with Cu electrodes. R. BEUTNER

Sweetened condensed milk. VI. Tallowiness. F. E. RICE. *J. Dairy Sci.* **9,** 459–68(1926); cf. *C. A.* **18,** 717, **20,** 1119, 2221, 2545.—Previous investigation (*C. A.* **17,** 3211) had indicated that the presence of *Cu* in condensed milk is a factor in tallowiness formation. Expts. here are carried out on sweetened condensed milk of factory manuf. and on samples condensed in a small Cu vacuum pan and in glass. As little as 2.5 mg. Cu per kg. is sufficient to produce tallowiness provided O is present, but neither is effective in absence of the other. The rapidity of development and strength of flavor vary with the amt. of Cu in the product and the concn. of O in the air space above the sample. Only the layer of milk in contact with O becomes tallowy. Depth of flavor varies with the amt. of fat. Tallowiness develops below 0° about as rapidly as at room temp.; heat sterilization does not prevent it; bacterial counts of tallowy samples are low; strong preservatives do not prevent the development of flavor. These facts are taken in support of the theory that the reaction is not due to enzymes or bacteria. It is concluded that tallowiness in a can of condensed milk is ordinarily due to the chem. action of O of the air on the fat of the milk, the reaction being catalyzed by the Cu cation. Sn is shown to be not effective while Fe is slightly so. F. E. R.

The enzyme content of buttermilk. FR. KLAGER. *Süddeut. Molk.-Ztg.* **47,** 814–5 (1926).—The content of reductase, catalase and diastase of buttermilk depends on the working of the cream and is greater in the buttermilk than in the unripened cream. The presence of these enzymes in the cream is an indication of the amt. of ripening. It may be used as index to keeping quality. GEORGE R. GREENBANK

Milk substitutes in the rearing of young calves. J. B. LINDSEY AND J. G. ARCHIBALD. Mass. Agr. Expt. Sta., *Bull.* **223,** 41–51(1925).—The comparative value of 7 calf meals and skim milk, skim milk and cornstarch, and skim-milk powder and cornstarch was detd. The mixt. giving the best results consisted of 45 parts ground rolled oats, 20 of skim-milk powder, 10 of linseed meal, 14 of cornstarch, 5 of cane sugar, 5 of alfalfa flour, 0.5 of $CaCl_2$ and 0.5 of salt. J. J. SKINNER

Resistance of bacteria of the typhus and paratyphus group in milk pasteurized by

holding. M. SEELEMAN. *Milchwirtschaft Zentr.* **55,** 117(1926).—Lab. expts. show that not all strains of these groups are killed by holding 30 min. at 63°. G. R. G.

Influence of carbon dioxide upon quality and keeping properties of butter and ice cream. F. F. SHERWOOD AND F. G. MARTIN. Iowa Agr. Expt. Sta., *Research Bull.* **95,** 181-207(1926).—The quality and compn. of butter were not influenced by CO_2, nor did it affect the bacteria. CO_2 did not improve the quality, texture, compn. or "standing up" quality of ice cream, nor did it affect the growth of bacteria. Neither butter nor ice cream retained appreciable quantities of CO_2. J. J. SKINNER

Experiments for greater churning yields. GUNNER JØRGENSEN. *Mølk-Ztg.* **40,** 1772-3(1926).—Other factors influencing the yield than those commonly recognized are size of fat globules, clumping, intensity of agitation, quantity in churn and low temps. GEORGE R. GREENBANK

Discoloration of cheese by tin foil wrappers. FREIESLEBEN. *Süddeut. Molk.-Ztg.* **47,** 896(1926).—Cheese wrapped in thin parchment and finally in tin foil often show discolorations on the surface. This is shown to be due to the presence of Cu, Pb and Fe in the foil. Bacterial action liberates S from the albumin which combines with the H generated, forming H_2S. As the cheese ages the reaction goes from acid to alk., pptg. the sulfides on the surface. GEORGE R. GREENBANK

Can corrosion and blackening in certain marine products. D. B. DILL AND P. B. CLARK. *Ind. Eng. Chem.* **18,** 560-3(1926).—Marine products on the acid side of p_H 6.5 do not blacken and for the most part do not corrode the container. Corroding products are more alk. than p_H 6.5. The sulfide S content of can-blackening products like crustacea increases to relatively high values in storage. Neither free O_2 nor volatile bases are significant factors in corrosion of the container or blackening of the flesh. L. D. ELLIOTT

Yoghurt, a dietetic and medicinal food. TH. STATHOPOULO. *J. pharm. chim.* [8] **3,** 415-23(1926).—The prepn. of several kinds of yoghurt is described, and detailed analyses are given of 7 com. samples, and of 8 samples prepd. from cow, sheep and goat milk. The valuable nutritive and medicinal properties of yoghurt are discussed. S. WALDBOTT

Determination of hydroxymethylfurfuraldehyde, and Fiehe's reaction (for differentiating natural and artificial honey). E. TROJE. *Z. Ver. deut. Zucker Ind.* **75,** 635-72 (1925).—Hydroxymethylfurfuraldehyde may be detd. colorimetrically by mixing its dil. aq. soln. with 10% HCl and a few drops of dil. Et_2O soln. of resorcinol, and observing the time taken for the gradually deepening red coloration to attain the intensity of specified standard solns. contg. fuchsine and methyl orange. A correction for temp. is involved. In the volumetric method the aldehyde is oxidized with a known excess of I in alc. soln. and the unchanged I is detd. after acidification, by titration with thiosulfate. Levulose is oxidized under the conditions specified, beyond the formation of a monobasic acid. Fiehe's color reaction (with resorcinol) for invert sugar, and other methods of detecting artificial honey and the adulteration of honey are critically reviewed. The time taken for the appearance of the red coloration is proportional to the concn. of the HCl used, and heating increases the intensity of the initial coloration, which is also more stable when HNO_3 is used in place of HCl. HNO_3 should not, however, be used in the presence of Et_2O. With H_2SO_4 the color develops more slowly than with HCl. Concd. HCl reacts with levulose with formation of hydroxymethylfurfuraldehyde, but 10% acid has no such action and this strength is recommended for the colorimetric test. Dried ethyl acetate is recommended for extg. the aldehyde from natural and artificial honey. The solvent is removed under diminished pressure and the residue examd. by the colorimetric and volumetric methods, the results obtained being in fair agreement. The solvent, however, under the conditions, only extracts 40% of the total aldehyde present in the sample, and the method is primarily of use for comparative purposes. The aldehyde content of pure honey varies (0.004-0.0278%; av. 0.0153%), while that of artificial honey has an av. value of 0.0488% (0.002-0.075%). The action of heat on natural honey may either increase or diminish the hydroxymethylfurfuraldehyde content. By inversion of sucrose in the cold with invertase invert sugar may be obtained with no more, and even less, aldehyde than natural honey, whereas inversion with strong acids or by heating leads to values considerably higher than those for natural honey. There is, however, no sharp lines of demarcation between the natural and artificial products in this respect. J. F. BREWSTER

Pectins. III. Modification of pectins during cooking. A. MEHLITZ. *Chem. der Zelle u. Gewebe* **12,** 353-61(1926); *Chimie et industrie* **16,** 301(1926).—Under the action of heat and of the acid which they contain, the true pectins of fruit juices are converted into pseudo-pectins by sapon. of the pectic esters. M. investigated these

changes in apple juice by detn. by means of the Ca-pectate method, and obtained the following results After 15 hrs. heating the true pectins had decreased to 16% of the total pectins. In unsweetened pectic solns most of the true pectins disappear during the 1st hr. of cooking, but their destruction proceeds very slowly for at least 10 hrs. Unsweetened pectic soln shows an increased acidity after 8 hrs.' heating. In 10 hrs.' heating about 20% of the pectins were destroyed, most of them during the first few hrs. Sweetened pectic solns. are much more stable than unsweetened solns., which can be explained by the decrease in acidity due to the addn. of sugar. Transformation of the pectins is affected by the temp. as well as by the acidity. From a practical standpoint, transformation of true pectins is considerably retarded by the addn. of sugar, providing the time of heating does not exceed 2 hrs. The results confirm the value of the Ca-pectate method for the investigation of pectins. A. P.-C.

Toasted cornflakes. A tariff problem. J. BUCHWALD AND H. KÜHL. *Z. angew. Chem.* **39,** 1073(1926)—The difference between dried and toasted cornflakes is detd. by the temp, not by the duration of heating. Cornflakes heated 5 hrs. to 105° showed no change in color or odor. The content in water-sol colloidal matter was 14.53%. Five min. heating to 193° produced a conspicuous change and after 15 min. the flakes were brown, had the characteristic toast odor and contained 38.15% water-sol. colloidal matter. MARY JACOBSEN

Variations in the composition of Colorado potatoes. N. E. GOLDTHWAITE. Colorado Agr. Expt. Sta, *Bull.* No. **296,** 3-77(1925)—Analyses were made on raw and cooked individual tubers of the different varieties. No 2 tubers of identical compn. were found in a variety, or in the same group or in the same hill The % of dry matter in potatoes varied inversely with the H_2O content, and generally the % of starch and of total carbohydrates varied likewise. Little relationship was apparent between the % of nitrogenous matter and ash. In irrigated potatoes the % of dry matter minus 6 71 gives approx. the % of starch The following approx ratios between percentages seems to hold for irrigated potatoes: starch : dry matter 1:1.42; total carbohydrate:dry matter 1:1.15; starch : total carbohydrate 1:1 24; starch:-H_2O 1.1.5 (wide approximation); and total carbohydrate : H_2O 1·3 897 (wide approximation). Boiled lengthwise cut halves of potatoes, cooled and unpeeled, showed nearly the same content of water. dry matter, starch and total carbohydrates as the corresponding raw halves, but less nitrogenous matter and ash. Steamed lengthwise halves had a smaller H_2O content than their corresponding raw halves and a greater content of dry matter, starch, total carbohydrates, nitrogenous matter and ash. Steaming potatoes appeared to ext. less of their nitrogenous matter and ash than boiling. RUSSELL M. JONES

The use of sodium nitrite in the curing of meat. ROBERT H. KERR, CLARENCE T. N. MARSH, WALTER F. SCHROEDER AND EDWARD A. BOYER. *J. Agr. Research* **33,** 541-51(1926)—$NaNO_2$ can be successfully substituted for $NaNO_3$ or KNO_3 in the curing of meat with a shortening of the customary curing period. Meats cured with the proper quantity of $NaNO_2$ in accordance with sound practice do not contain more nitrites than meats cured with nitrates; they are free from the unconverted nitrates regularly present in nitrate cured meats, and are in no way inferior in quality and wholesomeness to meats cured with nitrates From $^1/_4$ to 1 oz. of $NaNO_2$ is sufficient to fix the color in 100 lbs. of meat, the exact quantity depending on the meat to be cured and the process employed. W. H. ROSS

Food values of New Zealand fish. V. Fats of the red cod in relation to its food. C. L. CARTER AND J. MALCOLM. *Trans. Proc. New Zealand Inst.* **56,** 647-50(1926).—A red cod (*A*) feeding on whale-feed in summer, a second cod (*B*) feeding in deep water in winter, and the whale-feed were extd for fat and the fats thus obtained were tested for the usual fat nos. The main characteristics of these fats were the same in both summer and winter fish. The following differences are noted· The fraction of fat sol. in both alc. and ether was 77% in (*A*) and 68% in (*B*). The livers of (*A*) were larger relatively to the wt. of the fish than those of (*B*). The percentage of liver oil was 47.3 in (*A*) and 40.4 in (*B*). The I values of both the liver oil and the fatty acids of the liver oil were less in (*B*). These results indicate a depletion of reserves during the scant feeding of the winter season. **VI. Vitamin A content of mutton-bird oil and of some fish oils.** JOHN MALCOLM. *Ibid* 650-8.—Mutton-bird oil was obtained from the stomach or crop of young birds (*Aestrelata lessoni*). Expts. with white rats proved that this oil contained vitamin A. Vitamin B appeared to be absent. The flesh fat of the tarakihi fish seems to contain a small quantity of vitamin A. Ethereal exts. of tarakihi flesh, of oysters and of red cod (flesh and liver) were not found to contain vitamin A. L. W. RIGGS

Chemical analysis of shark's fins. KUO-HAO LIN. *J. Biochem.* (Japan) **6**, 323–33 (1926).—Shark's fins constitute one of the important Chinese delicacies. The raw fins are boiled for 1/2 hr. and the skin is scraped off; they are then boiled until they fall to pieces. The meat, skin and bone are now sepd. from the fins which are dried and ready to be sold. The fins as they were obtained in the market show the following composition. They are free from fat or carbohydrate; they have an ash content of 0.84% of which 0.70% is in the form of S; they have a N content of 17.18% so that they seem to represent nothing but protein. From the standpoint of nutrition this is an incomplete protein, since it is lacking in tryptophan. It is not certain what proteins go to make up the fin, but it is obviously more than gelatin alone. The percent of different amino acids is recorded: arginine, histidine and lysine constitute practically 1/3 of the total amt. of amino acids. S. MORGULIS

Silage trials conducted at the Jaffna Experiment Station. G. HARBORD. *Trop. Agr.* (Ceylon) **66**, 162–4(1926).—Analytical data on cholam and green oats silages are given. A. L. MEHRING

Oats for horses. J. ALAN MURRAY. *Fertilizer, Feeding-Stuffs and Farm Supplies J.* **11**, 629–30(1926).—M. attributes the apparent superiority of oats over barley and corn as food for horses to the probable presence of certain proteins, as yet unidentified, in the former which contain relatively large amts. of essential amino acids such as tryptophan and lysine. The occasional occurrence of colic in horses resulting from the feeding of new oats is attributed to the form in which the starch is present in the new grain. Chem. changes which may accompany the development of diastatic enzymes in the grain during storage are thought to eliminate this deleterious action since no cases of colic have been directly traced to the feeding of oats that have been stored for several months after harvesting. K. D. JACOB

Treatment of packing-house, tannery and corn-products wastes (MOHLMAN) **14.** Chemical and physiological study of maturity in potatoes (APPLEMAN, MILLER) **11D.** Apparatus for drying fruits or vegetables (U. S. pat. 1,603,103) **1.** Tunnel kiln for dehydrating fruits (U. S. pat. 1,602,988) **1.** Funnel filter for milk or other liquids (Brit. pat. 243,257) **1.**

Butter. MILK OIL CORPORATION. Brit. 242,363, Aug. 12, 1924. Melted milk oil at a temp. of 35° or higher is mixed with an emulsifying agent such as milk or milk powder and H_2O or "reassembled milk" until the fat globules are approx. the same size as those in natural milk or cream. The emulsion is then cooled to a temp. (which may be about 15°) at which the fat globules have a tendency to stick together and the cooled material is pressed as with a spoon, paddle or roller, to cause sepn. of butter.

Butter substitute. E. V. SCHOU. U. S. 1,603,155, Oct. 12. A gelatinized oil such as blown refined soya oil is used with sufficient pure oil, *e. g.*, cottonseed oil, to dissolve the gelatinized oil, and an aq. component is permanently dispersed throughout the oil mixt. to produce a consistency similar to that of butter. Cf. *C. A.* **20**, 787.

Food rich in vitamins. H. LIEBERS. Brit. 242,645, Nov. 8, 1924. Yeast is mixed with concd. exts. of germinated cereals, *e. g.*, barley malt ext. On standing, the mixt. acquires a fruit aroma and by heating to 50–70° reactions between the constituents of the product may be stopped. The yeast and malt ext. used may both be dehydrated. Cf. *C. A.* **20**, 3051.

Preserving eggs. T. F. ASTON and W. H. STEVENS. Brit. 242,780, Nov. 22, 1924. Eggs are coated with a mixt. of H_3BO_3 10, paraffin 87.3 and white beeswax 2.7%.

Candy. J. K. FARLEY, JR. U. S. 1,601,302, Sept. 28. A plastic cooked batch of candy has mixed with it an ingredient such as crystal sugar to form nuclei of crystn. and an ingredient, *e. g.*, $(NH_4)_2CO_3$, adapted when heated to form gas and puff up the candy, and the mixt. is then heated to effect puffing.

Preserving fruits. P. W. BARCLAY. U. S. 1,601,101, Sept. 28. Raw fruit is submerged in cane sirup and maintained at normal temp. until the juices are partly extd. from the fruit. The fruit and sirup are then cooked in a closed vessel contg. a heated stirring device and the atm. pressure in the vessel is reduced during the cooking to lower the b. p. and vapor is drawn off, condensed and returned to the fruit and sirup. An app. is described.

Fruit pomace extract. E. MONTI. U. S. 1,602,162, Oct. 5. A sirup compd. is prepd. from fruit pomace ext. from which the pectin and other colloids have been removed, concd. to a sp. gr. of about 1.25, mixed with whole fruit pomace ext. concd. to a sp. gr. of about 1.40, so that the mixt. has a sp. gr. of about 1.30 and contains less than 50% of the sugar, pectin and other colloids of the raw fruit but substantially

all of the non-sugary crystalloid ext of the fruit in unaltered condition. U. S. 1,602,163 specifies a mixt for use as a *food* or *medicine* comprising the digested protein of eggs, milk, blood and the like in the concd. ext. of grape juice and another fruit or berry juice of higher acidity, *e. g.*, juice of oranges or tomatoes.

Apparatus for dehydrating fruits and vegetables. C. C. MACPHERRAN. U. S. 1,602,830, Oct. 12

Preparing grapefruit for canning. E H. LEFEVRE and S. S. WALKER. U. S. 1,601,027, Sept 28. The circumferential portion of the membrane that envelops the fruit-sections is disintegrated by a hot lye soln and the fruit is washed and cooled preparatory to canning and "processing."

Treating protein materials. A. KREMPF U. S 1,602,029, Oct. 5. Materials such as nitrogenous animal wastes are mixed with nitrochloroform or other volatile antiseptic, stirred as digestion proceeds and treated with a metallic catalyst, *e. g.*, Ni, ferro-Ce, Fe or Mn, promoting digestion The different products formed by the digestion are sepd mechanically and the volatile antiseptic is eliminated from them. The products are suitable for *nutritive purposes*.

Apparatus for smoking fish. A. H. COOKE and C. F. TAYLOR. U. S 1,602,650, Oct. 12

Sausage casings formed from viscose. W F. HENDERSON. U. S. 1,601,686, Sept 28 Tubular casings of cellulose hydrate of a thickness not more than 0.003 in when measured dry are formed by extruding a viscose soln in tubular form into a pptg bath and stretching the tube during its formation and while it is interiorly supported, *e. g.*, by a mandrel.

Flavoring composition for use in foods. P N WOO U. S 1,602,958, Oct. 12. A vegetable protein such as wheat gluten is dissolved in HCl at a temp below the coagulating point of the protein, a small quantity of metallic Sn is added and hydrolysis is effected at a temp above 100° for 6-8 hrs, sufficient NaOH or other suitable alkali is added to decompose the glutamine acid hydrochloride and ppt dissolved Sn, the major part of the inorg salts is removed, and pptn with alc is then effected

Flavoring extracts containing ethyl lactate as a solvent. E. G. THOMSSEN. U. S. 1,602,183, Oct. 5

Preserving fodder. A MESSMER. U. S 1,603,136, Oct 12. Freshly cut green fodder, in an air tight container, is sprayed with a soln prepd from NaCl, $CaCl_2$, Na phosphate and ferrous lactate, to prevent butyric fermentation

Stock feed containing bacteria pasteuriana (to aid digestion of cellulosic materials). H. C REINHOLD and F. L FULTZ. U S. 1,601,323, Sept. 28.

13—GENERAL INDUSTRIAL CHEMISTRY

HARLAN S MINER

The development of the chemical industry in Italy. P. G CONTI *Ind. Eng. Chem* **18**, 999 1002(1926) E. J C.

Research relations between engineering colleges and industry. W. E. WICKENDEN. *J. Am Inst. Elec Eng* **45**, 987-8(1926). C G. F.

Excellent seminars for practicing engineers. A challenge to engineering teachers. *J Am. Inst Elec. Eng.* **45**, 996 8(1926) C. G F.

The relation of chemistry to the development of power. R. T. HASLAM. *Ind. Eng Chem.* **18**, 1047-52(1926). **Relation of by-product coke ovens to super-power development.** F. H. NEWELL. *Ibid* 1052 4. **Trends in power development with special reference to mineral fuels.** A. C. FIELDNER *Ibid* 1054 7. **Hydroelectric power in industry. The role of industry in the distribution of power.** L. H. DAVIS. *Ibid* 1058 61. **Our future sources of energy.** H. L DOHERTY *Ibid* 1062-4.—These papers were presented at the conference on the "Role of Chemistry in the World's Future Affairs" at the Inst. of Politics, Williamstown, Mass E. J. C.

Raw materials—waste and by-products. J E. TEEPLE. *Ind Eng. Chem.* **18**, 1187-90(1926).—A discussion presented before the Round Table Conference on the "Role of Chemistry in the World's Future Affairs," Inst. of Politics, 6th session, Williamstown, Mass E. J. C.

Synthetic versus natural products. ROGER ADAMS. *Ind. Eng. Chem.* **18**, 1182-6 (1926)—A paper presented at the Round Table Conference on the "Role of Chemistry in the World's Future Affairs" at the 6th session of the Inst. of Politics. In addn. to the general discussion special consideration is given to dyes, nitrates, N fixation, metals and alloys, medicinals, artificial silk, rubber and MeOH. E. J. C.

The laws regulating the production of particles of various sizes in fine grinding. GEOFFREY MARTIN. *Trans. Inst. Rubber Ind.* **2**, 125–32(1926).—Exhaustive expts. by the Brit. Portland Cement Research Assoc. have established the science of grinding on a mathematical and quant. basis The general conclusions were that (1) in producing powders from brittle crystals the surface produced is proportional to the work done; (2) the no. of particles produced increase with decreasing diam. according to the compd. interest law; (3) the av. shape of the particles is the same regardless of the fineness of crushing; (4) homogeneous grades of irregularly shaped particles of a const. statistical diam. exist; (5) in any homogeneous grade if the no of particles is plotted against the diams. the probability law is followed; (6) there is a definite relation between the statistical radius of a homogeneous grade of irregularly shaped particles and the linear speed of any gas or liquid which will just lift them; (7) if a series of sieves has openings decreasing in arithmetical progression, the ratio of the nos. of particles remaining on 2 successive sieves is the same up or down the series and (8) 1 statistical diam gives accurately the surface, vol and wt of the statistical particles of 1 homogeneous grade. The work shows that grinding in an air current does not increase the grinding efficiency. The work required to grind a substance can be calcd. from its latent heat of evapn., since grinding brittle crystals to the ultimate limit is the same as gasifying them. Hence from the heat of volatilization of a substance and the efficiency of the app. the cost of grinding to any degree can be calcd The abs grinding efficiency can be detd. by grinding crystals of known heat of volatilization and detg the work, *e. g.*, as ft.-lbs. to increase the surface of quartz by 1 sq. ft. C. C. DAVIS

The flow of air and steam in pipes. W H. MCADAMS AND T. K. SHERWOOD. *Mech. Eng.* **48**, 1025–9(1926).—"Equations and curves in units convenient for engineering calcns" E. J. C.

Gas mask protecting against carbon monoxide. K. BUNTE. *Gas u. Wasserfach* **69**, 815–6(1926)—The upper limit of the mask is 6% CO, its life at 0.1–0.7% CO is 20–30 hours, the filling not being specifically described W. B. PLUMMER

Electrical refrigeration in textile mills (STURTEVANT) **25**. Industrial research in Holland (ROSENHAIN) **2**.

Device for drying gases. L. H HILL. U. S. 1,601,308, Sept. 28. A body of drying material is movably supported, *e g*, upon a spring, and is connected with an indicator for showing the condition of the drying medium as it absorbs H_2O and depresses the spring by resulting increase in wt

Methylene chloride as a solvent for various organic substances. A. EICHENGRÜN. Brit 243,030, Nov. 17, 1924. CH_2Cl_2 either alone or with other solvents or with non solvents is used as a solvent of fats, oils, mineral oils, rubber, resins, bituminous substances, alkaloids, cellulose esters and other org substances, for extn., cleaning or other purposes

Separating gaseous mixtures by liquefaction. SOC AMMONIA. Brit. 242,583, Nov 6, 1924 An app. is described in which, for the extn of H from coke oven and other industrial gases, the "cold" necessary for the condensation of the gases accompanying the H is obtained from the gases under treatment and from an outside supply of liquid N.

Colloidal sols and emulsions. G. C. HURRELL Brit. 242,689, July 17, 1924. For dispersion of solids in liquids of a b p below the m. p. of the solid (*e. g.*, dispersing S, bitumens of high m. p., pitches and waxes in H_2O contg. a small quantity of a stabilizer such as a soap, gum or glue) the solid is liquefied under increased pressure in communication with the dispersion liquid, the 2 liquids are emulsified together and the emulsion is cooled while still under pressure so that the dispersed particles solidify. An app is described.

Drying tobacco, silk or other hygroscopic materials. A. C. BUENSOD. U. S. 1,567,031, Dec. 29, 1925. Drying is in automatically controlled stages. In the first stage, heating is effected; in the second stage, heating with accompanying controlled moisture supply; and, in a third stage, relatively cool moist air is employed. An app. and various details and modifications are described.

Separating constituents of air or other gaseous mixtures by liquefaction and rectification. J. LE ROUGE. U. S. 1,602,535, Oct. 12. An app. is described.

Treating mineral oils or other liquids with purifying agents. T. A. SMITH. Brit. 243,113, Sept. 13, 1924. The liquids circulate countercurrentwise through a series of gravity separators with intermediate mixing pumps.

Heat-insulating material. J. L. McEwan and C. McEwan. Brit. 242,852, Dec. 12, 1924. "Silicate cotton" is teased out to free it from slag particles, placed in a mold, impregnated with dil. Na silicate soln. and quickly dried in a hot oven to produce a cellular structure.

14—WATER, SEWAGE AND SANITATION

EDWARD BARTOW

Securing improved technical supervision of water-purification processes. H. E. Miller. *J. Am. Water Works Assoc.* **16,** 355-72(1926).—Distinct economies in the case of supplies purchased as well as improvement in operating results followed technical supervision. North Carolina only is considered. The importance of the A. W. W. A. in this work is stressed. D. K. French

Experimental studies of water purification by the U. S. Public Health Service. H. W. Streeter. *J. Am. Water Works Assoc.* **16,** 336-41(1926).—A preliminary review. Under similar conditions exptl. plant results show close agreement in practice. Neither variation in raw water turbidity nor seasonal changes seem to have any decided influence on the over-all efficiency of bacteria removal. D. K. French

Use of pulverized fuel in the water works plant. C. S. Denman. *J. Am. Water Works Assoc.* **16,** 296-301(1926).—Numerous advantages of pulverized fuel are found. D. K. French

Data on zeolite water softeners. T. J Ess. *Power Plant Eng.* **30,** 888(1926).—Formulas for the calcn. of the size of softener needed are given. K. C. Beeson

Water-treating problems encountered in railroad practice. S. C Johnson. *Mech. Eng.* **48,** 1023-4(1926). E. J. C.

Progress of water treatment on railroads. R. E. Coughlan. *Mech. Eng.* **48,** 1024(1926). E. J. C.

How turbid Colorado River water was made fit to drink. I. C. Harris. *Eng. News-Record* **96,** 896-7(1926).—The water supply of El Centro, Calif., is drawn from an irrigation canal carrying Colorado River water, which contains about 1% by wt. of sediment. The water flows through 8 settling reservoirs which provide a retention period of 5-10 days, and is filtered through two 24 by 200-ft. filters of 5 million gals. per day capacity at normal rate of 22.7 million gals. per acre per day. Other than chlorination of filter effluent, no chem. treatment is employed. The filters are cleaned with a traveling Blaisdell washer. Sedimentation removes approx. 90% of bacteria from raw water and the filters about 90% of those remaining. Aeration is desirable to reduce tastes due to vegetable growths in canals. Content of sol. salts averages 300-400 p. p. m. R. E. Thompson

Salt content of Colorado River increased in twenty-five years. C. S. Scofield. *Eng. News-Record* **97,** 131-2(1926).—Results of analyses of Colorado River water for 3 yearly periods from Oct. 1, 1922, to Sept. 30, 1925, are given, together with the results of similar studies carried out in 1900 and 1905. The salt content ranged from 210 to 1250 p. p. m., the mean for the 3 years being 896, 839 and 997, resp., compared with 713 and 723 in 1900 and 1905, resp. The constituents, expressed as reacting values, during the last year reported were Ca 5.82, Mg 2.56, HCO_3 3.64, Cl 3.62, SO_4 7.82. The av. hardness for the 3-year period was 260 p. p. m. as $CaCO_3$, the percentage hardness, *i. e.*, the proportion of alk.-earth bases to the total reaction units, being 56, 53 and 55% for the 3 years, resp. R. E. Thompson

Activities of the (Ohio) State Department of Health with reference to stream pollution. C. C. Hommon. *Ohio Conference on Water Purification, Fifth Annual Report* **1925,** 8-13(1926).—Activities in regard to stream pollution in Ohio are reviewed. Legislation enacted in 1925 provides for the approval of the State Dept. of Health of the proposed treatment of municipal sewage and industrial wastes, and authorizes that body to adopt regulations necessary for preventing undue pollution. A survey of streams of the state for the purpose of detg. the major sources of pollution has been almost (90%) completed. R. E. Thompson

The lead mine as an active agent in river pollution. K. E. Carpenter. *Ann. Appl. Biol.* **13,** 395-401(1926).—The effect of lead mine waste upon the fauna of a stream is described. The inefficiency of careful "sedimentation" in removing toxic matter from lead mine waste is indicated. The agent responsible for the toxic action of the mine waste upon aquatic animals is the metallic substance, principally Pb, dissolved by the water. Two methods are suggested to eliminate the toxic action

of lead mine waste: the reduction of the solvent power of the water for Pb by the use of silicates, and the elimination of the dissolved metals in the water, before discharging the water into the river, by adsorption upon suitable filters. C. H. R.

Well-water development with air-lifts at Lansing, Mich. L. R. HOWSON. *Eng. News-Record* **96,** 846–8(1926).—Addns. to the water-supply system of Lansing consist of 12 wells pumped by air-lift. This source of supply was selected in preference to a filtered and chlorinated supply from Grand River owing to its natural purity and const. temp. of about 50° F. The temp. of the river water varies from 32° to 80°. R. E. T.

Water works intakes of the Great Lakes Region. G. H. FENKELL. *J. Am. Water Works Assoc.* **16,** 267–95(1926).—Water works cribs and intakes are considered from an operating rather than a sanitary point of view. Ice gives the most trouble. D. K. FRENCH

Progress on seal of safety campaign. C. S. SLADE. *Ohio Conference on Water Purification, Fifth Annual Report* **1925,** 13–8(1926).—Progress in the work of locating and marking safe public and semi-public water supplies in rural districts in Ohio is reviewed. The supplies are judged by (1) quality of the water, (2) development of the supply and (3) sanitary conditions of the vicinity. Of 1443 supplies examd., 105 or 7.28% were found satisfactory, as follows: drilled wells 102, dug well 1, springs 2. R. E. THOMPSON

Progress of seal of safety campaign in Pennsylvania. H. E. MOSES. *Ohio Conference on Water Purification, Fifth Annual Report* **1925,** 83(1926).—Progress in examn. of water supplies on state highways in Pennsylvania is reviewed briefly. Sanitary surveys of the supplies were carried out and samples from those approved were examd. in a traveling lab. Approx. 50% of the supplies approved by the sanitary engineer were found to be of satisfactory bacteriol. quality. R. E. THOMPSON

Plotting a life line of Tacoma's water supply conduit. W. A. KUNIGK. *Eng. News-Record* **96,** 562–3(1926).—An investigation of the water-supply conduit showed conditions contributory to the early decay of wood-stave pipe, of which the major portion of the line was constructed, were: insufficient pressure to saturate the staves; laying of pipe in made ground or in very rich loamy soil, especially where dry; contact of surface soil, decaying roots and wood or vegetable mold with pipe; use of sap lumber; and proximity of coal mines. R. E. THOMPSON

Unique reservoir lining for Port Angeles, Washington. M. P. HATCHER AND E. L. FERGUSON. *Eng. News-Record* **96,** 859–61(1926).—Port Angeles, a city of 10,000 people, recently completed a water-works program involving an expenditure of $625,000, which included the purchase of the existing privately owned system and the development of a new 11-million gal. per day supply from Morse Creek. Total available supply is now 14 million gals. per day, or 1400 gals. per capita. R. E. THOMPSON

Moot questions in the design of lake intakes. PAUL HANSEN. *Eng. News-Record* **96,** 861–2(1926).—A brief discussion of the design of intakes, in which tabulated details are given for a no. of existing structures. In Lake Michigan, the influences of wave action and undertow probably do not extend below 40 ft. Difficulties due to frazil ice are not usually experienced at depths of 30 ft. or more. The extension of Marquette, Mich., intake to a depth of 56 ft. was unsuccessful in avoiding phenol wastes and zone of seasonal turn-over. If intakes are placed at reasonable depths it is questionable whether any special form of intake structure is necessary. R. E. THOMPSON

Correct chart for converting Kutter's "n" into Hazen and Williams' "c." R. DE L. FRENCH AND F. M. WOOD. *Eng. News-Record* **96,** 954–5(1926).—A chart is given and the method of its use is described briefly. R. E. THOMPSON

Adaption of slide rule for computing flow in pipes and open channels. J. B. LIPPINCOTT. *Eng. News-Record* **96,** 658–9(1926).—A curve showing the approx. relation of Williams' and Hazen's "c" and Kutter's "n" for open channels is given, which was prepd. to facilitate computation of flow with the Williams and Hazen slide rule. R. E. THOMPSON

Flow of water in 54-in. concrete conduit, Denver, Colo. F. C. SCOBEY. *Eng. News-Record* **96,** 678–80(1926).—Flow tests on 54-in. concrete conduit in Denver and similar tests carried out on the same sized pipe in Tulsa, Okla., in 1924 indicate that the Scobey formula with a coeff., C_s, of 0.370, is very conservative. R. E. THOMPSON

Experience with the use of the De Lavaud centrifugally cast iron pipe, Kenosha, Wisconsin. P. J. HURTGEN. *J. Am. Water Works Assoc.* **16,** 373–6(1926). **Knoxville, Tennessee.** F. W. ALBERT. *Ibid* 376–80. **Macon, Georgia.** R. E. FINDLAY. *Ibid* 380–2.—**Memphis, Tennessee.** JAMES SHEAHAN. *Ibid* 838–45. **New Bedford, Mass.** S. H. TAYLOR. *Ibid* 385–6.—Four of the five cases favor the De Lavaud pipe; one, Kenosha, Wisconsin, is non-committal. D. K. FRENCH

Slide rule for submerged orifices and Cipolletti weirs. H. K. Smith. *Eng. News-Record* **97,** 512-3(1926).—A brief description. R. E. Thompson

Winkler's method for determining the oxygen dissolved in water and its application in the presence of oxidizable substances. Gustaf Alsterberg. *Biochem. Z.* **170,** 30-75(1926); cf. *C. A.* **20,** 790.—The following precautions should be observed in the Winkler method: The $MnCl_2$ soln. should be free from Fe and the KI concn. of the alk. KI soln. should be sufficiently high; the sample, after the proper reagents are added, should not be left standing longer than 15 min. If the detn. cannot be completed at once, the sample should at least be acidified before it is left to stand. The 0.01 *N* $Na_2S_2O_3$ soln. should be standardized by KI and not by $K_2Cr_2O_7$. The original Winkler method is not applicable to H_2O contg. impurities. The modifications proposed by Winkler to meet this situation are worthless because they assume that the losses in O_2 occur during the process of acidifying whereas most interfering substances tend to reduce the oxidized $Mn(OH)_3$ ppt. in the alk. medium. Washing the ppt. to remove interfering substances is useful only in the presence of nitrite, whereas H_2S, SO_2 and Fe in various forms and org. substances are not affected. Preliminary oxidation by $KMnO_4$ causes really big errors since the dissolved O_2 is now activated and has a greater tendency directly to oxidize the org. substances present. The various Fe compds. can be made ineffective only with great difficulty. Even the presence of nitrites necessitates preliminary treatment of the water. The sample should be treated with free Br_2, the excess being reduced with salicylic acid. About 0.5 cc. of a *N* soln. of Br_2 is enough for a 125 cc. sample. The sample of water is left with the free Br_2 for 24 hrs., 0.5 cc. of salicylic acid reagent is added, and 15 min. later the water is ready for the O_2 detn. by the usual Winkler procedure. The interference of Fe (Fe^{++} has the more serious effect causing losses, while Fe^{+++} is responsible for too high results) is entirely done away with by the use of H_3PO_4. H_2S is one of the most common and also serious interfering substances but is completely oxidized by the Br_2 provided long enough time is allowed (24 hrs.). The nitrites are practically at once converted to nitrates by the Br_2 treatment and no longer interfere with the reactions of the method. Likewise the conversion of the important interfering ferrocyanide into the much less interfering ferricyanide compds. is an added advantage of the preliminary Br_2 treatment, besides its actual preserving action. In the presence of cyanides or thiocyanates the treatment with Br_2 may cause high results because the Br_2 will be in a combination not acted upon by the salicylic acid reagent. A correction for this has not yet been worked out. S. Morgulis

The determination of fixed and free carbonic acid in water. Critical study. V. Rodt. *Zement* **14,** 206-9, 249-53(1925).—The detn. of carbonate CO_2 by titration with 0.1 *N* acid using Me orange gives good results provided the liberated CO_2 is expelled by boiling. The detn. of free CO_2 by addn. of an excess of $Ba(OH)_2$ soln. and back titration is unreliable since increasing the excess of $Ba(OH)_2$ gives increased yields. Fair results are obtained in H_2O largely free from org. acids by pptg. the free CO_2 with $Ba(OH)_2$ soln. and, without filtering, adding HCl and weighing the evolved CO_2 after absorption in a suitable train. To det. the active CO_2 in H_2O, a sample was agitated gently for 24 hrs. with an excess of finely pulverized marble, filtered, and the new carbonate CO_2 content titrated with dil. acid. H. F. K.

Solving some unusual problems in sand filtration. M. E. Dice. *Chem. Met. Eng.* **33,** 529(1926). **High-pressure filtration of softened water.** L. H. Biggar. *Power Plant Eng.* **30,** 1050(1926).—Air bubbled through the sand makes craters into which the ppt. works. The minute air bubbles in the water also prevent perfect filtration. By increasing the head on the filter to at least 13 ft., and by using a fine sand of a low uniformity coeff. these obstacles are overcome. Formulas for detg. necessary head and rate of flow are given. K. C. Beeson

Removing mud balls from filter sand. M. E. Flentje. *Eng. News-Record* **97,** 369(1926).—Mud balls in the filters at Oklahoma City, Okla. were removed by passing the sand through an ordinary sand jet discharging against the filter wall at cost of $20 per filter. A partial analysis of the balls, which were due to inadequate washing and insufficient carbonation of the lime-softened water being treated, was: moisture 18, acid-sol. material 9.5, ignition loss 0.4 and residue 72.1%. R. E. Thompson

Reduction of mud balls in rapid sand filters. A. V. Graf. *Eng. News-Record* **96,** 1031-2(1926).—A brief description of the method employed at the Chain of Rocks filtration plant, St. Louis, for disintegrating mud balls, which consists of jetting the sand from one end of the filter to the opposite end with a hydraulic ejector while wash water is being applied. R. E. Thompson

High-pressure filtration of softened water. L. H. Biggar. *Power Plant Eng.*

30, 1050(1926).—Penetration of the sand by the ppt. occurred when the head was less than 13 ft. From 13 ft. to 33 ft. no penetration occurred. It is believed that at low heads, air works up through the sand forming craters in the surface into which the ppt. gradually works. Fine sand of low coeff. of uniformity which gives a high porosity should be used. K. C. BERSON

Buffalo starts its water filters. WELLINGTON DONALDSON. *The Nation's Health* **8,** 591–3(1926).—A brief history of the water supply of Buffalo and a description of the new filtration plant recently put into operation. The plant is exceptional in the completeness of its metering and controlling devices. R. E. GREENFIELD

Reconstruction of the Albany water filters. ALLEN HAZEN. *Eng. News-Record* **97,** 380–6(1926).—Recent addns. and repairs to the Albany filtration plant are described and illustrated in detail. The essential addns. were a new coagulation basin and new aerators. The water, which is drawn from the polluted Hudson River, is aerated at the inlet to the coagulation basin after addn. of coagulant, passed through pre-filters at the rate of 75–115 million gallons per acre per day, aerated again, passed through slow sand filters at the rate of 6 million gallons per acre per day, and finally chlorinated. During 1925 the av. color was reduced from 55 to 8. The av. no. of bacteria in the raw water was 67,500 per cc., and in the coagulation basin, pre-filter and final filter effluents, 4950, 300 and 5, resp. R. E. THOMPSON

Akron trickling filters will use 223,000 cu. yd. of limestone. J. E. ROOT. *Eng. News-Record* **96,** 803(1926).—After a study of the available material, 1–2$^{1}/_{2}$-in. limestone was chosen as the medium for the 14 acres of 10-ft. trickling filters, which, with Imhoff tanks, will be the main features of the new sewage works of Akron, O. The phys. properties specified were (1) hardness, not less than 14%; (2) toughness, not less than 5; and (3) wear, not more than 6, the method of examn. to be the standard technique for road-construction materials. It was also required that the stone should show no checking, cracking or disintegration after 20 successive treatments by the Na_2SO_4 test. R. E. THOMPSON

New collector for sampling of filter sand. A. V. GRAF. *Eng. News-Record* **96,** 868–9(1926).—App. for sampling sand of mech. filters designed by John Allgeyer consists of a 2-in. split and hinged brass pipe which is lowered vertically into the sand bed during washing and withdrawn after the wash water has been shut off and the filter completely drained. R. E. THOMPSON

Pneumatic filter-alum conveyor for Minneapolis water filters. J. A. JENSEN. *Eng. News-Record* **96,** 766–8(1926).—The pneumatic conveyors installed at the new Fridley 40-million gallons per day filtration plant, with which granulated alum can be moved from cars to primary storage, or from cars and primary storage to service hoppers, at the rate of 12 and 8 tons per hr., resp., are described and illustrated. It has been guaranteed that loss due to escape of dust will not exceed 0.1%. A disadvantage of this system where volumetric dry feed machines are employed is that stratification of the coagulant interferes with the accuracy of delivery. This will be remedied by a method of checking by weighing. R. E. THOMPSON

New water pumping and filtration plant, Hannibal, Mo. M. P. HATCHER. *Eng. News-Record* **96,** 727–8(1926).—Addns. to the water works of Hannibal, consisting of a 11-million gal. per day electrically driven pumping station and a 6-million gal. per day mech. filtration plant, are described. The supply, which is drawn from the Mississippi River, was formerly only coagulated, settled and chlorinated. Modification of the settling basin provides a storage capacity of 8 million gals. each for raw and filtered water. Lime and alum will only be applied during approx. 2 months of the year when the turbidity is high. The av. water consumption is 2.25 million gals. per day by a population of approx. 19,300. R. E. THOMPSON

Laboratory reaction apparatus helps operate filters. CHAS. H. SPALDING. *Eng. News-Record* **96,** 644–5(1926).—Results of lab. expts. on coagulation carried out at Oklahoma City are described and graphically illustrated. When $FeSO_4$ and lime were used with a 30-min. reaction period, it was found that addn. of the former just prior to the latter gave the greatest clarification, while when the $FeSO_4$ was added after the lime it was found that the softening reaction should be allowed to proceed several min. before the coagulant is added. If the interval is increased beyond 5 min. the reaction period for the $FeSO_4$ is correspondingly reduced with consequent loss in coagulant value. When alum and lime were used, addn. of the coagulant after the lime was most effective. The interval in this case may be 10 min. When optimum coagulation is obtained long subsidence has little advantage. In lab. expts. $FeSO_4$ was more effective and economical than alum, but in practice it is found advisable to use alum also, $FeSO_4$ alone failing to give as clear an effluent apparently because of a difference

in floc. The expts. were carried out in an app. consisting of 6 pptn. jars in a row beneath a countershaft carrying a paddle for each jar. Power is furnished by a small motor and each paddle can be operated independently of the others. R. E. T.

Home-made electrolytic chlorine at Sacramento. H. N. JENKS. *Eng. News-Rec.* **97,** 170–2(1926).—The electrolytic chlorination app. at the Sacramento filtration plant is described briefly and illustrated. The installation, which has a capacity of 228 lb. per 24 hrs., consists essentially of motor generators and six 600-amp. electrolytic cells, the Cl dosage being regulated by adjustment of a rheostat on the filter-operating gallery. The cost of production, including investment charges, is 5–7¢ per lb. of Cl compared with 12.5¢ for liquid Cl, the latter being exclusive of app. Cl is applied to both the raw water and filtered water, this treatment having been found to be an aid to the elimination of taste and odors due to algae. During 1925 the cost of chlorination was approx. 12¢ per million gallons R. E. THOMPSON

Boiler feed-water purification. I. Natural waters and their impurities. S. T. POWELL. *Power* **64,** 12–5(1926).—This is the first of a series of articles on the "prevention of corrosion or scale in boilers by proper methods of feed-water purification." Each article is an abstracted chapter of a book soon to be published. **II. Getting rid of impurities by sedimentation and coagulation.** *Ibid* 49–52. **III. Filtration by gravity and pressure filters.** *Ibid* 93–5 **IV. Softening water by chemicals.** *Ibid* 129–32. **V. Hot-process continuous softeners.** *Ibid* 165–8. **VI. Zeolites explained.** *Ibid* 208–10 **VII. Where zeolites fit in.** *Ibid* 236–8. **VIII. Boiler compounds.** *Ibid* 279–81. **IX. Priming and foaming.** *Ibid* 330–3 **X. Embrittlement—what causes it?** *Ibid* 371–4 **XI. Evaporators, their design and operation.** *Ibid* 406–10. **XII. Getting rid of dissolved gases by deaeration.** *Ibid* 441–4. **XIII. Corrosion—its cause and cure.** *Ibid* 471–4. **XIV. Deconcentrators and continuous blowdown.** *Ibid* 520–3. **XV. Feed heaters and miscellaneous treatment.** *Ibid* 552–4. D. B. DILL

Preparation of feed water for steam boilers by evaporators. WINTERMEYER. *Feuerungstechnik* **14,** 263–6(1926)—A review of the advantages of feeding boilers with distd water, and of the methods and app. for providing it. ERNEST W. THIELE

Lye concentrations in boiler plate seams. R. BAUMANN. *Arch. Warmewirtschaft* **7,** 255–60(1926).—In order to test the theory that many failures of boilers are due to the embrittling action of strong caustic solns. accumulating in boiler seams, an artificial seam was prepd. in the bottom of a small boiler, in which 1% NaOH soln. was boiled. Under no conditions of rate or time of boiling, width or shape of crack, or tightness of seam was the concn. of liquid in the crack as high as 3%. The material in the seams of boilers in use was found to be ordinary scale, with no unusual alkali content. ERNEST W. THIELE

Army engineers recommend restricting Chicago diversion. H. J. TAYLOR. *Eng. News-Record* **96,** 576–8(1926).—Report to Congress states that a diversion of 4167 sec.-ft. is sufficient for both navigation requirements and Chicago sewage disposal. A study to det. a reasonable pollution standard indicated that no nuisance would result if liquid discharged by a drainage canal, as evidenced by the av. of representative samples taken for any 30 consecutive days, (*a*) was practically free of solids deposited in 2 hrs., and (*b*) contained not less than 3 p. p. m. dissolved O_2 and sufficient to equal or exceed the biochem O_2 demand of said liquid for 5 days when incubated at 20°. Data are given which show the cost of sewage-treatment plants which would be required by Chicago for different rates of flow in the canal, that for 4167 sec.-ft. being $69,213,520. No method of sewage treatment known to be practicable would maintain the pollution standard unimpaired with a flow of 2000 sec.-ft. R. E. THOMPSON

Town of 4000 spends $90 per capita for water and sewage. W. L. BENHAM. *Eng. News-Record* **96,** 852–5(1926).—The new water-supply system of Elk City, Okla., consists of a dam impounding water from a drainage area of 23$^1/_2$ sq. miles in a reservoir of 250-million gals capacity, aerator, mixing chamber, coagulation basins, two 0.5-million gals. per day mech. filters, and chlorination equipment. The cost of the entire project including extensions to the distribution system and sewer improvements was $356,000. R. E. THOMPSON

Municipal progress at Lubbock, Texas. H. N. ROBERTS. *Eng. News-Record* **97,** 290–1(1926).—The sewage works, constructed in 1922, consist of an Imhoff tank, sprinkling filters, secondary settling tank and chlorinating app. The effluent was formerly discharged into Yellowstone Canyon, but will in future be disposed of by land irrigation. R. E. THOMPSON

New Bay City (Mich.) water works displaces two old plants. J. W. ELLMS. *Eng. News-Record* **96,** 682–3(1926).—The new Bay City plant consists of 4000-ft. intake in

Saginaw Bay, 2 hydraulic-jump mixing flumes, 2 baffled 2-million gal. coagulation basins, providing a detention period of nearly 5 hrs. at a max. plant capacity of 20 million gals. per day, and ten 2-million gals. per day mech. filters designed for high velocity wash. The gravel and sand layers in the filters are 20 and 30 in. in thickness, resp., the former being graded from $^1/_8$ to $2^1/_2$ in. in diam. and the latter having an effective size of 0.36 mm. and a uniformity coeff. of 1.74. R. E. THOMPSON

Operations of Baltimore sewage works, 1920–1925. C. E. KEEFER. *Eng. News-Record* **97,** 174–9(1926); cf. *C. A.* **19,** 367.—An extensive illustrated description of the Baltimore sewage works and its operation, with particular reference to the period 1920–1925. The plant consists of bar screens, settling tanks, revolving screens, trickling filters, final settling tanks, sludge-digestion tanks and sludge-drying beds. The use of Imhoff tanks has been discontinued because of their failure to function satisfactorily, and the tanks are now being employed for sludge digestion. The percentage removal of settling solids in the preliminary tanks increases with the amt. in the raw sewage. The optimum temp. for nitrification in the trickling filters has been found to be 70° F. The value of the final settling tanks is doubtful as the removal of solids is low and the nitrate content and relative stability of the effluent are considerably less than the influent Expts. indicated that the sludge dries more rapidly on cinder beds than on sand beds. Addn. of alum to the digested sludge increases the rate of drying. Expts. are being conducted to det. the effect of alum on the value of the sludge as a fertilizer. Tabulated analyses of the sewage at various stages of treatment, sludge statistics, and operating costs are given for the years 1912–1925 inclusive. R. E THOMPSON

Sewage treatment at Austin, Minnesota. FREDERIC BASS. *Eng. News-Record* **97,** 339-42(1926).—Following the rejection of plans for a direct oxidation installation, the town of Austin, Minn., has constructed a 1.33-million gals. per day plant consisting of Imhoff tanks, percolating filters, Dorr clarifier and sludge-drying bed, at a cost of $220,000. The flow is about 1 million gallons per day from a population of 12,000. R. E. THOMPSON

Chlorination studies being continued at Schenectady, New York. M. M. COHN. *Eng. News-Record* **97,** 436–7(1926).—Additional chlorinating equipment has been secured and the entire flow of 9 million gallons per day is being chlorinated at the inlet to the Imhoff tanks at the rate of 6 p. p. m. The treatment has been effective in destroying odors from the tanks. Application of 20–30 p. p. m. of Cl to the trickling filters for 48 hrs. removed the film from the surface of the beds and reduced the no. of psychoda flies It is believed that occasional treatment of filters to prevent formation of fresh film will effectively control the flies. R E. THOMPSON

Effect of chlorination on trickling sewage filters. M. M. COHN. *Eng. News-Record* **96,** 943–8(1926).—The results of extensive studies on the effect of chlorination on trickling filters at Schenectady, in which Cl dosages of 4–41 p. p. m. were employed, are summarized as follows: (1) nitrification is not improved, nor permanently or materially destroyed; (2) the tank effluent is rendered practically sterile; (3) the normal filter odors are reduced proportionately to the amt. of Cl applied; (4) biological growths are removed from the nozzles and distribution pipes; (5) the film is removed from the surface of the filters, preventing pooling and production of odors from putrefaction of the film; (6) the no. of psychoda flies present is reduced by the destruction of the film, which is their breeding ground; (7) the suspended and colloidal solids in the effluent are increased when 10 p. p. m. or more of Cl is applied, due to removal of film and sloughing of this material through the filter. Periodical application of $CaOCl_2$ will control the development of the psychoda flies and remove growths from nozzles, reducing the tendency of the beds to pool, without destroying the nitrifying efficiency of the filter. A dichlorobenzene mixt., "Solvent 75," when sprayed on walls, etc., will destroy psychoda, mosquitoes and young spiders. R. E. THOMPSON

Schenectady sewage chlorination studies. ANON. *Eng. News-Record* **96,** 1035–6 (1926).—Discussion of expts. on chlorination of trickling filters at Schenectady (cf. preceding abstract) by H. P. Eddy, F. W. Mohlman and Willem Rudolfs, and reply to the same by M. M. Cohn. E. and M. question the economic practicability of the treatment and R. discusses the theory of chem. disinfection and points out that the increase in colloidal material in the effluent indicates that the Cl was inhibitory to the putrefying organisms present in the filter. C. states recent expts. indicate that chlorination of raw sewage can be carried out more economically than chlorination of the tank effluent. Further studies are being conducted. R. E. THOMPSON

Effect of chlorine on the absorption of dissolved oxygen by polluted waters. P. GAUNT AND W. E. ABBOT. *J. Soc. Chem. Ind.* **45,** 323–4T(1926).—Cl reduces the absorption of dissolved O. Increased dilns. cause the effect to disappear. It is rec-

ommended that effluents might be chlorinated where the dissolved O of the dilg. water is not sufficient to take care of the effluents. K. C. BEESON

Experiences with chlorine treatment of water and sewage. G. ORNSTEIN. *Z. angew. Chem.* **39,** 1035-7(1926).—Chlorination of raw water at Hamburg to kill the algae reduced filter washing 75%. 1.5 p. p. m. of Cl were used and only a slight dosage was required on the filtered water. Chloramines increase the effectiveness of Cl treatment. K. C. BEESON

Sewage sludge marketed for 3 years at Schenectady, N. Y. M. M. COHN. *Eng. News-Record* **97,** 252-4(1926).—The settling solids in the Schenectady sewage are removed and digested in Imhoff tanks, and dried on sand and gravel filters. The digested sludge, which contains 95% water, cracks within 48 hrs. and dries to a forkable condition in 7 days under favorable conditions. The shrinkage in vol. during drying averages 65%. The dried cake has a moisture content of 60-70%, which is reduced to about 45% in the storage piles. A total of 2287 cu. yds. of dried sludge was produced during the summer of 1924 and 2848 cu. yds. in 1925, contg. 0.33-0.98% N, 1.5-1.81% H_3PO_4, 54% org. matter and 5% ether-sol. matter. Most of the grease is removed by the aid of rain and sunlight. The sludge is an excellent fertilizer and an appreciable market has been developed at a nominal charge of 25¢ per load. R. E. THOMPSON

Early days of separate sludge digestion. H. W. CLARK. *Eng. News-Record* **96,** 1031(1926).—A brief discussion of the history of separate sludge digestion and of the work of the Lawrence Expt. Sta. in relation to the same. R. E. THOMPSON

Separate sludge-digestion system for small town use. JERRY DONOHUE. *Eng. News-Rec.* **96,** 690(1926).—The sewage treatment plant of Hartford, Wis., which consists of a bar screen, Dorr clarifier, sludge digester and sludge-drying bed, is described and illustrated, and brief tabulated details are given of 9 other similar plants. Provision has been made for installation of an aeration unit, should further purification be necessary. The digester was seeded with old horse manure. During operation for 1 year the drying beds, which consist of 3 in. of fine sand on 18 in. of broken stone, were only used twice. The sludge dried in 5-7 days in each instance. The town is sewered on the separate system, the flow to the treatment works being 0.4 million gals. per day. R. E. THOMPSON

Toledo intercepting sewers. III. Discharge works. H. P. JONES. *Eng. News-Record* **96,** 718-21(1926).—The pumping station, elliptical skimming tank and submerged outfall at Toledo are described and illustrated. As a result of the sewage works improvements the dissolved O_2 content of the water of Ten Mile and Swan Creeks has increased from 0 to 70% satn. R. E. THOMPSON

Detention periods for sewage tanks operated in parallel. R. T. REGESTER. *Eng. News-Record* **97,** 153(1926).—A diagram is given for estg. the no. and capacity of settling tanks required for given flows and detention periods. R. E. THOMPSON

Apparatus for activated-sludge tests at Essen, Germany. F. SIERP. *Eng. News-Record* **97,** 505(1926).—A brief description of app. for activated-sludge expts., consisting of a glass aquarium divided into settling and aerating compartments (cf. *C. A.* **20,** 1292). R. E. THOMPSON

New activated-sludge plant at Essen, Germany. KARL IMHOFF. *Eng. News-Record* **97,** 298-9(1926).—An activated-sludge unit has been added to the works treating the sewage from that part of Essen which drains to the Ruhr River. The plant, which treats 5.8 million gallons per day from a population of 45,000, now consists of coarse racks, a shallow grit chamber, Imhoff tanks, aeration tanks and final sedimentation tanks. A spiral motion is induced in the flow through the aeration tanks by paddles, the surface aeration thus effected being augmented by compressed air applied through diffuser plates. Compressed air alone may be employed but the air required is then 0.7-1.0 cu. ft. per gallon compared with 0.14 when the paddles are employed, the power consumption being 22 and 8 h. p., resp. R. E. THOMPSON

Activated-sludge plant for three small California cities. F. M. VEATCH. *Eng. News-Record* **97,** 10-3(1926).—An illustrated description of the activated-sludge plant under construction to serve Pomona, Claremont and La Verne, Cal., designed on the basis of an av. and max. flow of 1.5 and 2.25 million gallons per day, resp., from a population of 20,000. The plant consists of an Imhoff tank, aeration tanks, final settling tank equipped with Dorr clarifiers, chlorination tank in which the effluent not used for irrigation will be chlorinated, sludge reaeration tank and sludge-drying bed. The excess activated sludge will be returned to the Imhoff tank for digestion. The total cost of the plant was $111,651.

Recovery of gas from the Decatur Imhoff tanks. WM. D. HATFIELD. *Eng. News-Record* **96,** 645(1926).—The sewage of Decatur consists of 5 million gals. per day

of domestic sewage and 8–12 million gals. per day of waste from starch works. The former, as judged by the biochem. O_2 demand, is equiv. to a population of 40,000, and the latter is equiv. to 350,000. Measurements of the gas generated in the Imhoff tanks indicate an av. production of 180,000 cu. ft. per day. The gas is composed of CH_4 70–80, CO_2 and N_2 20–30, and H_2S 0.1–1.0%. The calcd. calorific value is approx. 700 B.t.u per cu. ft. About 14 cu. ft will generate 1 brake h. p. in a combustion engine. R. E. THOMPSON

Determination of the degree of pollution of the atmosphere. D'ARSONVAL AND F. BORDAS. *Compt rend.* **182,** 823–5(1926).—A modification of the Owen app. has been devised which will be described in a later paper. Its sanitary importance is discussed. C. G. KING

The problem of domestic wastes. FETTWEIS. *Technique sanit.* **20,** 289(1925).—Belgian practice. PIOT. *Ibid* 285.—Swiss practice. J. J. H., JR.

Removal, treatment and utilization of domestic wastes in France. FREMOND. *Technique sanit.* **20,** 272–85(1925). JACK J. HINMAN, JR.

Chemical characteristics of some trade wastes. A. M. BUSWELL, R. E. GREENFIELD AND A. R. SHIVE. *Ind Eng. Chem.* **18,** 1082(1926).—Analyses of wastes from pea and corn canneries, strawboard, paper and roofing factories, distilleries and of domestic sewage are given. K. C. BEESON

Disposal of some organic trade wastes. EDWARD BARTOW. *Ind. Eng. Chem.* **18,** 1085(1926).—Dried packing-house sludge contains 6–8% N, but no satisfactory method has been found for dewatering and drying it. KCl, K_2SO_4, KNO_3, betaine-HCl, and glutamic acid have been made or recovered from beet-sugar wastes. Waste utilization in starch factories has reduced the org. content of effluents in some cases said to be less than 0.5% of the corn used. K. C. BEESON

Partial evaporation of trade waste eliminates taste in water. R. L. MCNAMEE. *Eng. News-Record* **97,** 95–6(1926).—Creosote taste in the water supply of Escanaba, Mich., drawn from Little Bay de Noc, was traced, by sampling through the ice, to a chem. works discharging a considerable vol. of wood-distn. waste. An arbitrary measure of the intensity of the taste producing constituents, termed the taste index, was employed, being the no. of thousand parts of water to which 1 part of the sample will impart a perceptible taste. Waste from a Myers still, which had a taste index of 300, was found to be responsible for 96% of the taste, although its vol. was only 1% of the total waste of the plant. Evapn. of 10% of this waste eliminated 96% of the taste-producing substances. Thus by evapg. 0.1% of the total waste of the plant, 92% of the taste-producing constituents were removed. R. E. THOMPSON

Developments in the field of industrial wastes in relation to water supply. A. L. FALES, *et al. J. Am. Water Works Assoc.* **16,** 302–29(1926).—The connection between coke-oven wastes and chlorophenol tastes and odors in water is discussed. D. K. FRENCH

Treatment of packing-house, tannery, and corn-products wastes. F. W. MOHLMAN. *Ind. Eng. Chem.* **18,** 1076–81(1926).—Exptl. results show that packing-house wastes should be treated by the activated-sludge process, tannery wastes by screening, settling, and diln. with domestic sewage, and corn-products wastes by trickling filters. K. C. BEESON

Admixture of irritants in hydrocyanic gas disinfection with especial reference to the use of chloropicrin as a danger indicator in zyklon C. THEODOR POHL AND BRUNO TESCH. *Desinfektion* **11,** 88–90(1926).—A danger indicator must resist decompn. by the wall materials. $ClCO_2Me$ had to be abandoned as not sufficiently stable. A mixt. of 10 parts (by wt.) HCN, 1 part chloropicrin and 0.3 parts CH_2BrCO_2Et is recommended as safe for the disinfection of apartments without the necessity of vacating the adjoining apartments, provided the usual precautions are observed and the wall material is sufficiently non-porous to warrant a safe HCN disinfection. M. J.

Chemical pretreatment of industrial water (DRECHSLER) **23.** The effect of anions upon the physical, chemical and colloidal properties of $Al(OH)_3$ (MILLER) **2.** Methods for treating and evacuating tannery sewage (NOVER) **29.** Vapor pressure and base exchange of zeolites and permutites (ROTHMUND) **2.** Filter for water (U. S. pat. 1,603,126) **1.**

Sewage disposal plant. G. G. SMITH. U. S. 1,602,052, Oct.
Septic tank. W. P. HOOKER. U. S. 1,601,755, Oct. 5.
Septic tank. T. J. DOWNEY. U. S. 1,601,611, Sept. 28.

15—SOILS, FERTILIZERS AND AGRICULTURAL POISONS

J. J. SKINNER

Future trends in soil conservation. J. G. LIPMAN. *Ind. Eng. Chem.* **18,** 1034–40(1926). E. J. C.

A general discussion of base exchange in soils. W. P KELLEY. *J. Am. Soc. Agron.* **18,** 450 8(1926) —A general discussion There is danger of trying to explain too much by ion exchange in soils F. M. SCHERTZ

Electrodialysis of the colloidal soil material and the exchangeable bases. SANTE MATTSON *J. Agr. Research* **33,** 553–67(1926) —Electrodialysis of 2 soil colloids which were representative of widely different groups of colloidal soil material showed that the quantity of bases that can be removed by this method is fairly definite and that the order in which the bases appear in the cathode chamber is Ca, K and Na, Mg, Al, Mn and Fe The total quantity of bases that electrodialysis removed from 1 colloid was about 5 times that removed from the other, and the results showed that the various bases are characterized by different degrees of removability. The proportion of the total Ca or Mn removed in this way was much greater than the proportion of Mg, K or Na, and the proportion of the total Al or Fe removed was still less Extn. of the 2 colloids with N NH_4Cl or 0 05 N HCl gave almost identical quantities of the univalent and bivalent bases with that obtained by electrodialysis. Treatment of the electrodialyzed colloids with a $CaCl_2$ soln developed quantities of acidity that approximated the base exchange capacities of the untreated colloids from which it appears that in the process of electrodialysis there is a substitution of H ions from the water for most of the univalent and bivalent cations removed by the elec. current Conclusion: Each of the univalent and bivalent bases in the colloid is present in 2 conditions which are defined as exchangeable and nonexchangeable The quantity of the exchangeable bases that can exist as cations in an outer Helmoltz layer surrounding the particle is considered It is pointed out that if the deductions involved in formulas connecting elec. migration with electrokinetic potential and charge of the particles are correct, only a part of the exchangeable bases in the colloid is present in the dissocd. condition W. H. ROSS

Nature of the colloidal soil material. P. L. GILE. *Third Colloid Symposium Monograph* **1925,** 216–27; cf *C A.* **19,** 3338 —Colloidal soil material consists chiefly of silica, alumina, iron, org matter, so-called "combined" water (not driven off at 110°), and smaller quantities of Mg, K, Ca, Ti, Na, P and Mn. Ten analyses show that no theory of its nature can be framed on constancy of compn. X-ray spectrographs show that the colloid is not wholly amorphous. A dispersed particle of soil colloidal material acts like a loose mosaic of mixed ingredients with an internal pore space Replaceable bases are mainly held at the surfaces presented by silica and org. matter JEROME ALEXANDER

The colloid chemistry of soils. EMIL TRUOG. *Third Colloid Symposium Monograph* **1925,** 228–40, cf. *C A* **19,** 3339 —A review covering soil acidity, formation and chem. nature of soil colloids and their function A new ***ultrafilter*** and a ***colorimetric method of detg. p***$_H$ ***in soils*** are described, the latter to replace the uncertain electrometric method JEROME ALEXANDER

The power of soils to absorb water from air. F. J. ALWAY. *Third Colloid Symposium Monograph* 1925, 241–6 - The view of Sir Humphry Davy (1814) that "the power of soils to adsorb water from air is much connected with fertility" seems to be fully substantiated; but "it does not appear yet satisfactorily established that the ability of soils to adsorb water vapor is a reliable measure of their colloid content." JEROME ALEXANDER

Method of counting soil bacteria according to their physiological groups. A. S. RAZOVMOV. *Trav. Inst. Fertilisants* (Moscow) 1925, No 82, 3-20; *Chimie et industrie* **16,** 127(1926).—R adopted a slightly modified Hiltner-Stromer method, as follows: shake thoroughly 100 g of soil with 100 g of H_2O in a sterilized 1-l. flask, dil. 1 cc. in 9 cc. H_2O, and distribute in 10 small flasks contg 9 cc of selective nutritive medium, sp. for each bacterium studied Incubate at 28 30° for 10-4 days for *Azotobacter,* 20–5 days for nitrifying bacteria, and 30 days for denitrifiers (*B. van iterson*). Beijerinck's medium for *Azotobacter* and a Ca tartrate medium for *B. stutzeri* gave excellent results; but the results were not so good with Winogradski's medium for nitrifying bacteria and with a cellulose medium for *B. van iterson* The soils in the neighborhood of Moscow contain 0–40,000 *Azotobacter* per g The distribution according to physiol. groups of the microflora in the fields of Dolgoproudni was: *Azotobacter* 0–800, nitrifying

bacteria 40,000–100,000, *B. van iterson* 40,000–70,000, *B. stutzeri* 400,000–600,000 per g. Increasing the CaO content by 2.46–24.6 tons per 1.1 hectare, and therefore also the alky. of the soil, increased the *Azotobacter* up to 1800, nitrifying bacteria up to 200,000, *B. stutzeri* up to 800,000 and *B. van iterson* up to 900,000 per g. Addn. of both CaO and fertilizers increased both the denitrifying bacteria and the *Azotobacter*. A soil with high CaO and org. matter contents contains a typical strain of *Azotobacter;* while others contain a slightly pigmented strain which does not form a film in a mannitol soln. The no. of *Azotobacter* varies with the seasons, being least in Sept. and Nov., while in Dec. it is the same as during the first half of the summer. A. P.-C.

Vegetation experiments on soil acidity. MITSCHERLICH. *Landw. Vers. Sta.* **104,** 158–64(1925).—The reaction of some soils, as judged by lab. tests may vary greatly under different conditions. To overcome this and other difficulties, a method involving vegetation expts. is proposed to provide a basis for practical recommendations as to liming and suitable fertilizing of individual soils. The effect of heavy applications to the soil of physiologically acid and alk mixts. of fertilizers on both an acid-sensitive plant (mustard) and an alkaki-sensitive plant (oats) is investigated. The results of such expts. with 50 soils and the conclusions to be drawn from them are tabulated. F. M. SCHERTZ

Soil acidity. GEHRING. *Landw. Vers. Sta.* **104,** 164–77(1925).—Many clay and heavy loam soils which give increased yields of crops on liming show little or no "exchange" acidity. With these soils there is a parallelism between the response to liming and the degree of satn. for Ca, *i. e.*, the relation between the percentage of exchangeable Ca and the total percentage of Ca which the soil will absorb. When the exchangeable Ca is 70% or more of the total which the soil will take up, no response from liming is to be expected The application of these results to soils of other types is discussed. F. M. SCHERTZ

Rhodesian soils and their treatment. E. V. FLACK. *Rhodesia Agr. J.* **23,** 591–5 (1926). —Approx. 50% of Rhodesian soils are of granite origin. Bright tobacco and peanuts are the most satisfactory crops on these soils. The Great Dyke formation contains much Mg, and grass does best upon it. Most Rhodesian soils are well supplied with N and K_2O, deficient in P_2O_5 and low in CaO, but do not respond to applications of CaO. A. L. MEHRING

The effect of some soil conditions on nodule formation of Crotalaria juncea (L.). N GANGULEE. *Ann. Appl. Biol* **13,** 244–55(1926).—Nodule formation in *C. juncea* is affected by variations in temp., moisture content and soil reaction. It was increased by higher moisture content, increased coarseness of the soil, and by reduced H-ion concn C. H. R.

Studies on carbon dioxide production in soil and solution. D. V. BAL. *Ann. Appl Biol.* **13,** 231–43(1926) —*B. prodigiosus* can decompose glucose and fructose most readily with sucrose next in order. Lactose and maltose are only slightly decompd. The quantity of CO_2 produced is not equiv. to the quantity of sugar used up; other products, EtOH, Me_2CO and org. acids, are formed. CO_2 production attains its max. in 3–4 days and then declines rapidly in spite of the presence of sugar and active organisms Successive addns. of sugar to cultures, when CO_2 production has reached a min., increase CO_2 production again to a normal value. Exhaustion of total available C, the formation of a film on the particles of org. matter, or the exhaustion of available mineral constituents are not responsible for the lowering of CO_2 production in the soil. Addns. of org. matter (glucose, oil cake) to soil, after CO_2 production has declined, restores the process to its initial level. C. H. R.

The effect of progressive doses of Chile saltpeter on the sugar beet. JAROSLAV SOUČEK. *Z. Zuckerind. cechoslov. Rep.* **50,** 419–22, 499–503, 507–14(1926); *Listy Cukrov.* **44,** 129ff(1925–6); cf. *C. A.* **18,** 3096.—The results, for 1924, of plots with no $NaNO_3$ (*a*), plots with 100 kg. $NaNO_3$ per hectare (*b*), 200 kg. (*c*), 300 kg. (*d*), and 450 kg. (*e*), were: wt. of roots in hundreds of kg. per hectare, (*a*) 329, (*b*) 354, (*c*) 370, (*d*) 384, (*e*) 398; wt. tops (same units), (*a*) 169, (*b*) 186, (*c*) 202, (*d*) 216, (*e*) 234; ratio tops to roots, %, (*a*) 51.5, (*b*) 52.6, (*c*) 54.7, (*d*) 56.2, (*e*) 58.9; % sugar, (*a*) 19.18, (*b*) 19.31, (*c*) 19.33, (*d*) 19.35, (*e*) 19.18; purity, (*a*) 89.8, (*b*) 90.2, (*c*) 90.1, (*d*) 90.2, (*e*) 90.0; % N in beets, (*a*) 0.141, (*b*) 0.140, (*c*) 0.144, (*d*) 0.148, (*e*) 0.156. The results were more favorable than in the previous year, as $NaNO_3$ lengthens the vegetation period, and the growing season for the above tests was longer, giving riper beets. The diminishing returns from the higher dosages are quite marked. The expts. could be classified into five groups. The % in 1923 (*a*) and 1924 (*b*) were: *A* expts. in which $NaNO_3$ caused a lower sugar content, (*a*) 35, (*b*) 8; *B* expts. in which one fertilized plot showed higher sugar than the control, (*a*) 25, (*b*) 10; *C* two plots higher than

the control, (*a*) 9, (*b*) 22; *D* three plots higher than the control (*a*) 10, (*b*) 21; *E* all plots fertilized with $NaNO_3$ higher in sugar content than the control, (*a*) 23, (*b*) 39. Groups *A* and *B* were soils of higher N content and group *E* was soil of lower N content. The results of $NaNO_3$ treatment were more marked in beets harvested later in the season on heavier soils, on soils lower in CaO, and on acid or neutral soils. W. L. BADGER

Effect of calcium carbonate, gypsum, and sodium carbonate on soils rendered acid with hydrochloric and sulfuric acids. F. MUNTER. *Landw. Vers. Sta.* **104,** 177–82 (1925); cf. following abstrs. F. M. SCHERTZ

Vegetation and field experiments on soils showing "exchange" acidity. RÖSSLER. *Landw. Vers Sta* **104** 182–202; cf preceding and following abstrs. F. M. SCHERTZ

Effect of plants on soil reaction and its importance in vegetation experiments. KRUGER. *Landw Vers Sta* **104,** 202–15; cf preceding abstrs.—Different aspects of soil acidity are discussed with particular reference to the bearing of "exchange" acidity on the varied effects obtained by liming different types of acid soils. F. M SCHERTZ

Process for calcining phosphate rock. G R FISHBURNE. *Am. Fertilizer* **62,** 21–5(1925). The process is reviewed for prepg calcined phosphate by heating phosphate rock with 5 to 15% of an alkali salt such as Na_2SO_4. The product obtained is light, porous and easily crushed and the P_2O_5 present is almost completely citrate sol. W. H ROSS

Decomposition of green and organic manures under tropical conditions. A W. R. JOACHIM *Trop Agr* (Ceylon) **66,** 308–12(1926).—Max nitrification was obtained with castor pomace and fish scrap about the 8th week, during the 10th week with peanut meal, fish guano and dried blood, and at the end of the 6th week with barnyard manure and 5 varieties of green manure After 6–8 weeks decompn denitrification proceeds faster than nitrification Approx 60% of the N in castor pomace and fish scrap, 40% in peanut meal and fish guano and 30% in dried blood were converted into nitrates in the soil Nitrification slowed up in soils contg less than 13.5% H_2O (⅔ satn) A L MEHRING

Absorption of fertilizers by Ceylon soils. A W. R JOACHIM *Trop Agr* (Ceylon) **66,** 303–8(1926) H_2O percolating through soil failed to leach out of it 20–53% of various sol fertilizers which had been mixed with it A 2-in rainfall in 2 hrs did not carry an appreciable amt of fertilizers mixed in the top 3 in of soil to a depth of 6 in Nitrates, chlorides, sulfates and phosphates, were absorbed in increasing amts. in the order named A L. MEHRING

Modern double-superphosphate manufacture. E W. LEWIS. *Fertilizer, Feeding-Stuffs and Farm Supplies J* **11,** 661–2(1926) —A description of the mfg. process with a brief discussion of the chem reactions occurring during the manuf. and storage of the product K. D. JACOB

Relative merits of mono-, di-, and tricalcium phosphates as soil fertilizers. G. INGHAM *J S African Chem Inst* 9, 10–5(1926) - The interaction of soil and fertilizer plays an important part in detg the solv or extractability of P_2O_5 by 1% citric acid In a series of soils treated with rock phosphate or with superphosphate the % total P_2O_5 extd varied from 80 to 11 for the rock phosphate and from 89 to 21 for the superphosphate A satd soln. of CO_2 dissolved varying quantities of P_2O_5 from different grades of phosphate rock Given abundant rainfall and a fair amt of org matter in the soil, the softer varieties of rock phosphate may be expected to give results almost equal to those of superphosphates except in soils contg. $CaCO_3$ M S ANDERSON

Relative merits of mono-, di-, and tricalcium phosphates as soil fertilizers. C. A. DAWSON *J S African Chem Inst* 9, 26–8(1926) — A discussion. M S. A

Relative merits of the application of mono-, di-, and tricalcium phosphates to the soil. H. H. DODDS. *J. S. African Chem Inst* 9, 21–5(1926). A discussion. M. S. ANDERSON

Relative merits of the application of mono-, di-, and tricalcic phosphates to the soil. H O. K WEBBER. *J S African Chem Inst* 9, 21–3(1926) —A discussion M S. A.

Relative merits of mono-, di-, and tricalcic phosphates as soil fertilizers. S. KLING *J. S. African Chem. Inst* 9, 3–9(1926) - A discussion M. S ANDERSON

Rock phosphates versus superphosphates. T. D HALL *J. S African Chem. Inst.* 9, 16–20(1926) —The results are given of plot expts. with different fertilizer treatments M. S. ANDERSON

Equipment for excavating marl. H. H. MUSSELMAN. Michigan Agr. Expt. Sta., *Quart Bull.* 9, No 1, 17–21(1926). J. J. SKINNER

Effect of time of irrigation on production of crude protein in wheat. ALVIN KEZER. *Cereal Chemistry* 3, 340–2(1926).—During the last five years the Colorado Exp.

Sta. has attempted to discover if possible the most critical period in the demands for water in the development of the wheat crop. After considerable preliminary work, the growth periods selected for application of water were germination, tillering, jointing, heading, blossoming and filling. Experience of the first year showed that it was necessary to give a small irrigation at the time of planting in order to insure germination. The irrigations at tillering and jointing produce the highest protein content in the crop. While the production of protein is higher for irrigation at the earlier growth periods, the best quality of protein and the best quality of wheat are produced with irrigation at heading and blossoming time. If not more than one irrigation is possible an irrigation at the heading period is the most important in the production of quality and yield. The total protein produced is slightly lower but better grain and better quality of protein result. L. H. BAILEY

A review of scientific investigations on green manuring in India. A. W. R. JOACHIM. *Trop. Agr.* (Ceylon) **65,** 325–31(1925). A. L. MEHRING

Nutrient needs of greenhouse tomatoes. F. T. MCLEAN AND F. R. PEMBER. Rhode Island Agr. Expt. Sta., *Bull.* **205,** 16 pp. (1926).—Tomatoes grown in the greenhouse for 4 years from April to August on a silt loam soil were found to be sufficiently nourished by applications per month of 15 lbs. per acre of N, 6 lbs. of P_2O_5, and no K. The soil used was not deficient in K. The dry vines contained 2% N, 0.7% P_2O_5 and 1.8% K_2O, and the dry fruit 2.7% N, 1.0% P_2O_5 and 1.8% K_2O. J. J. SKINNER

Fumigation by hydrocyanic acid gas applied to the soil. C. H. BEAUMONT. *J. Dept. Agr. S. Australia* **29,** 954(1926).—Expts. with granular $Ca(CN)_2$ sprinkled in trenches in greenhouses give promise of very effective results against the eelworm. M. S. ANDERSON

Suspected poisoning of stock. M. H. KINGCOME AND A. W. FACER. *Rhodesia Agr. J.* **23,** 591–5(1926).—As, CN, strychnine and plant poisoning are discussed. A. L. MEHRING

Pyrethrum, its culture and application as a vermicide and an insecticide. M. STAEHELIN. *Heil- und Gewürz-Pflanzen* **9,** 39–45(1926).—A description of the cultural requirements of pyrethrum and manner of application (in soap soln.) for the eradication of many common garden and house pests, as caterpillars, aphids, fleas, etc., in general. W. O. E.

The discovery of the insecticidal property of carbon disulfide. PEREZ SIMMONS AND GEO. W. ELLINGTON. *Science* **64,** 326–7(1926). E. J. C.

Further experiments on the use of sulfur in relation to wart disease of potatoes. W. A. ROACH AND W. B. BRIERLEY. *Ann. Appl. Biol.* **13,** 301–7(1926).—Results of field tests are given. C. H. R.

Discussion on "The fungicidal action of sulfur." ANON. *Ann. Appl. Biol.* **13,** 308–18(1926).—The experiences of a number of investigators are given. C. H. R.

A quantitative examination of the toxicity of 3,5-dinitro-*o*-cresol and other compounds to insect eggs, under laboratory and field conditions. C. T. GIMINGHAM, A. M. MASSEE AND F. TATTERSFIELD. *Ann. Appl. Biol.* **13,** 446–65(1926).—3,5-Dinitro-*o*-cresol and its Na salt are toxic to eggs of *Selenia tetralunaria* (*C. A.* **20,** 2556) and other more resistant insect eggs, the Na salt being only slightly less toxic than the uncombined compd. Both were highly toxic to eggs of the aphid, *Phorodon humuli*, and had a general cleansing effect on plum trees. No injury to plum trees was observed. C. H. R.

Studies on contact insecticides. IV. A quantitative examination of the toxicity of certain plants and plant products to Aphis rumicis L. (the bean aphis). F. TATTERSFIELD, C. T. GIMINGHAM AND H. M. MORRIS. *Ann. Appl. Biol.* **13,** 424–45(1926); cf. *C. A.* **20,** 2556.—This is a study of the toxicity of certain plants to aphids. EtOH exts. of roots and stems of white haiari, stems of black haiari (species of *Lonchocarpus* from British Guiana), roots of *Tephrosia toxicaria* and leaves of *T. vogelii* possess notable insecticidal properties. When taken internally by caterpillars, the haiaris, *T. toxicaria* and *T. vogelii* have both a toxic and a repellent action. A toxic substance identical with tubatoxin (found in *Derris elliptica*) was isolated from the haiaris. A toxic resinous substance was isolated from *Tephrosia;* crystals closely resembling tephrosin (cf. Hanriot, *Compt. rend.* **144,** 150, 498, 651(1907)) were less toxic. Of a no. of other alkaloids tested, cytisine and lobeline were less toxic to aphids than nicotine, whereas eserine approached nicotine in toxicity. C. H. R.

Calcium cyanide for exterminating rats. V. J. KONINGSBERGER. *Arch. Suikerind.* **34,** 669–79(1926).—Rats in cane and rice fields can be killed easily by introducing 3 g. of granular $Ca(CN)_2$ into the rat hole, and plugging the exit with earth. This method is quick, simple, and cheap. It has no effect on cultivated plants, and the

residue left, $Ca(OH)_2$, is harmless. $Ca(CN)_2$ in dust form is not practical in Java, because the blower is too heavy for the coolie. A systematic campaign which would probably reduce the rats to a negligible no., is outlined. F. W. ZERBAN

Calcium cyanide and its utilization in the control of insect pests in Ceylon. W. H. BRITTAIN. *Trop. Agr.* (Ceylon) **67,** 45–9(1926). A. L. MEHRING

Sumatra derris root. ANON. *Fertilizer, Feeding-Stuffs and Farm Supplies J.* **11,** 663–4(1926).—The roots of the tuba plant (*Derris elliptica*) and particularly the root bark contain 2.5 to 3% of a resinous, poisonous principle known as derrid, which possesses valuable insecticidal properties. The sources, process of manuf. and use of this material as an insecticide are discussed. K. D. JACOB

Fumigation with hydrocyanic acid gas. Concentration and distribution as influenced by fumigation procedure. B. J. SMIT AND T. J. NAUDE. *Dept. Agr. Union S. Africa Sci. Bull.* No. **48,** 3–23(1926).—A comparison is made of the distribution of HCN produced in a fumigation chamber by the pot method and from liquid HCN. In the pot method the gas rises rapidly to the highest part of the chamber and descends along the sides of the chamber to the floor. In the course of this movement every part of the chamber sampled receives a wave of gas stronger than that of the theoretical concn. After about 10 min. the distribution is uniform all over the chamber. This rapid movement of gas is caused by the heat of the reaction between the hot H_2SO_4 and the NaCN, and by the steam rising from the generator. When, in fumigations with liquid HCN, the liquid is allowed to evap. without the heating or other aids to evapn., the nature and area of the surface on which the liquid is poured have an important effect on the spread of the gas. An unlimited smooth surface gives much more satisfactory results than a limited smooth surface. An unlimited porous surface (air-dry soil) gives inferior results. The results obtained by evapn. of the HCN by heat are practically the same as in the pot method. The results are graphically represented. RUSSELL M. JONES

Fertilizing rubber gardens in Java (ULTEE) **30.** Treating potassiferous silicates [for fertilizers] (Brit. pat. 242,336) **18.** Organic Hg compounds [as plant-protecting media] (Brit. pat. 243,361) **17.**

Fertilizer. F. W. FREISE. U. S. 1,601,954, Oct. 5. Crude nitrogenous material such as leather scrap is mixed with H_2SO_4 and phosphate rock and Ca cyanamide are added. Cf. *C. A.* **20,** 3532.

Alkali dicalcium phosphate. RHENANIA VEREIN CHEMISCHER FABRIKEN AKT.-GES. AND H. BRENEK. Brit. 242,512, March 20, 1925. A phosphate suitable for use as fertilizer is obtained by heating a mineral phosphate with "silicic acid in the form of silicates, sand or mineral phosphates rich in silicic acid" together with alkali salts such as carbonates or sulfates.

Insecticide and fungicide. C. DICKENS. Can. 263,491, Aug. 17, 1926. A soln. of Se in an aq. soln. of BaS is specified.

16—THE FERMENTATION INDUSTRIES

C. N. FREY

The effect of manganese on alcoholic fermentation. N. ROSENBLATT AND A. J. MARCH. *Biochem. Z.* **170,** 344–54(1926).—The addn. of Mn salts to give concns. of Mn from 0.001 to 0.1% produces a gradually increasing inhibition of the alc. fermentation of sugar. The concn. of the sugar acts as a protection to the zymase: an increase in the sugar concn. necessitates an increase in Mn concn. to effect the same degree of inhibition, the increase of the latter being relatively much greater. On the other hand, in the presence of the same Mn-concn. the amt. of sugar fermented increases with the rise in the concn. of the substrate. S. MORGULIS

Proportion of spent hops in brewing. WIEGMANN. *Allgem. Brauer- u. Hopfenztg.* **1926,** No. 43; *Brasserie et malterie* **16,** 189–90(1926).—The spent hops are about 60% of the wt. of hops originally taken. The much larger residues (up to 98%) obtained when no hop extractor is used are due to a considerable proportion of ext. from the wort remaining in the spent hops. Dark beers give a slightly larger amt. of spent hops than pale beers. A. PAPINEAU-COUTURE

Brewing with and without hop extractor. WIEGMANN. *Z. ges. Brauw.*, March 20, **1926;** *Brasserie et malterie* **16,** 200–4(1926).—There is much less resin unaccounted

for when the extractor is used, and a greater proportion is retained in the beer when the extractor is used, so that the beer contains more resins though the amt. of hops used is only 90% of what is used without the extractor. Distribution of the resins in 2 brews of pale beer, with and without extractor, resp., was found to be as follows:

	Original Resins		In beer	Lost in fermentation	In breaks		In spent hops		Unaccounted for
	Soft	Hard			Soft	Hard	Soft	Hard	
Without	92.0	8.0	31.2	10.3	20.3	7.1	7.1	2.0	22.0
With	92.4	7.6	38.0	9.6	23.7	5.1	6.4	6.0	11.2

The bitter, so-called soft resin, are partially converted during brewing into hard resins.
A. Papineau-Couture

The function of nitrogen in the stability of beer. De Moor. *Petit j. brasseur* **34,** 85 93(1926); *Chimie et industrie* **16,** 120(1926).—From a discussion of the various factors involved in the increase or decrease of N compds. which can be assimilated by the yeast, de M. shows that the carbohydrate and nitrogenous contents of the wort should be balanced, that its acidity should be such as to give a beer with p_H 4.1–4.2, but that the latter should decrease with increase in the residual available N.
A. Papineau-Couture

Chemical equilibrium of monopotassium tartrate (cream of tartar) in aqueous and dilute alcoholic solutions with reference to the development of wines. Theodor Paul. *Arb. Reichsgesundh.* **57,** 94–111(1926); cf. *C. A.* **11,** 2708.—The soly., acidity (H-ion concn.), sp. elec. cond. and d were detd. for satd. aq. and dil. alc. solns. of $KHC_4H_4O_6$ at 0°, 5°, 10°, 14°, 18°, 20°, 25° and 30°. This work was undertaken as a contribution to the study of the reactions taking place by the sepn. of cream of tartar during the development of wines and for the detn. of the acidity of these. Satd. solns. were prepd. by dissolving pure $KHC_4H_4O_6$ in pure CO_2-free water and with 50, 80 and 100 g. German pharm. alc./l. The soly., which was detd. after P.'s method (*C. A.* 9, 1964; **10,** 2272), increases in both aq. and dil. alc. solns. with the temp., the increase being proportionally larger at the higher temps. The sp. cond., detd. after the method of Kohlrausch-Ostwald, and the soly. both decrease approx. proportionally with the alc. content. The d. was detd. to 5 decimals with a Sprengel-Ostwald pycnometer. The calcns. of the dissocn. equil prevailing in a soln. of $KHC_4H_4O_6$ are expressed in 7 equations, which permit the calcn. of the H-ion concn. as well as the other ion and mol. concns. The acidities (H-ion concns.) were also detd. experimentally by the sugar inversion method and were in agreement with the calcns. (cf. *C. A.* **11,** 2709; 18, 3133). From the detd. values of H^+ and K^+, the concns. of the other mols. and ions, *viz.*, $KHC_4H_4O_6$, $H_2C_4H_4O_6$, $HC_4H_4O_6^-$, $KC_4H_4O_6^-$ and $C_4H_4O_6^{--}$, were calcd. The equation for the calcn. of the sp. cond. is advanced in which detd. values for the migration velocity of the ions are inserted. With respect to the great no. of factors involved, the values calcd. from this agreed well with those obtained experimentally. The dissocn. consts. for $KHC_4H_4O_6$ in aq. soln. were calcd. from the concns. of the individual ions and mols. to $K_a = 1.4 \times 10^{-1}$ for the dissocn. into the ions K and $HC_4H_4O_6$ and to $K_h = 6.7 \times 10^{-5}$ for the ions H and $KC_4H_4O_6$, the first being about 2000 times greater than the latter. The soly product of $KHC_4H_4O_6$, expressed by $(K^+)(HC_4H_4O_6^-)$, was calcd. to $L_p = 4.6 \times 10^{-4}$ in aq. soln. at 20°. This value decreases with the addn. of alc. At 80 g. alc./l., which represents the av. alc. content of the German white wines, $L_p = 1.7 \times 10^{-4}$ was found.
D. Thuesen

Recent processes of wine treatment (sulfurization and clarification). Adolf Günther. *Arb. Reichsgesundh.* **57,** 112–21(1926).—Two recent processes are discussed for the cellar treatment of wine, permitted in Germany since 1923 (1) sulfurization with solns. of pure SO_2 in distd. water in a min. strength of 5%, or with $K_2S_2O_5$, and (2) clarification with c. p. $K_4Fe(CN)_6$.
C. N. Frey

Sugar-inverting bacteria and their industrial application (Mezzadroli) **11C.**

Fermentation of cellulosic materials. H. Langwell. U. S. 1,602,306, Oct. 5. In fermenting cellulosic materials such as rice straw or maize cobs or the production of AcOH, butyric acid and alc. by the action of organisms from manure, the H-ion concn. is maintained between 10^{-9} and 10^{-5}, measured in the bulk of the mash by the addn of compds. of NH_4 or of an alkali metal after the addn. of $CaCO_3$ or other compd. of a metal the phosphate of which is substantially insol. in H_2O.

Dehydrating alcohol. Distilleries des Deux-Sèvres. Brit. 243,368, Nov. 20, 1924. In dehydrating alc. by distn. in the presence of a liquid which yields an azeotropic

mixt. as described in Brit. 214,581 (*C. A.* **18,** 2783), the app is arranged to effect removal of impurities such as AcH, ether, acetone, Et formate or MeOH. If the impurity does not form a binary mixt. with the added liquid, it may be withdrawn directly from the top of a distg column

Autolysis of yeast and other microörganisms. M. KAHN, E. LEBRETON and G. SCHAEFFER Brit 243,373, Nov 19, 1924 In a process as described in Brit. 225,228 (*C. A.* **19,** 1606), 5 20% of NaCl is added to the material subjected to autolysis to prevent formation of alc and a temp of 40 55° may be maintained for a few hrs. before the addn of the NaCl, quickly to effect autolysis

17- PHARMACEUTICAL CHEMISTRY

W O EMERY

Simple acidimetric determination of mercuric chloride. E. RUPP AND P. MAISS. *Apoth Ztg* **40,** 474(1925) —$HgCl_2$ may be titrated with 0 5 *N* KCN soln, with phenolphthalein as indicator Since HCN is without effect on dimethylaminoazobenzene, methyl orange, or methyl red, $HgCl_2$ may also be detd ; these indicators are used and titration is made with NaOH as follows KCN soln (0.2 g in 30 cc) is neutralized with 0 1 *N* HCl, with 1 of the above indicators $HgCl_2$ soln is added and titration carried out with 0 1 *N* NaOH When $HgCl_2$ is to be detd in pastilles, eosin must first be removed by animal charcoal if either methyl orange or dimethylaminoazobenzene is to be used as indicator B. C A.

The tenth edition of the American Pharmacopeia. Pharmacognostic articles. L. E GOESTER *Pharm Weekblad* **63,** 1133 41(1926) —A critical review A W. D

Influence of row spacing on the essential oil content of Coriandrum sativum L. and Pimpinella anisum L. O. DAFERT AND ILSE WALLENTIN. *Heil- und Gewurz-Pflanzen* **7,** 49 55(1924) In both plants the max production of oil was obtained with a row spacing of 20 cm W O. E.

Essential oils from some cultivated eucalypts. I. A. R. PENFOLD *J. Proc. Roy Soc N S Wales* **60,** 55-9(1926) —In comparing the yields and compn. of African oils with the published figures for Australian trees, investigators have heretofore failed to make due allowance for the variations which occur with differences in the compn of the soil, altitude, climate, season, moisture, etc The present study treats of oils obtained over varying periods from trees grown from seed near Sydney in good garden soil having access to a moderate quantity of moisture. *Eucalyptus australiana.*—Seed sown in 1917 The leaves and terminal branchlets cut as for com purposes yielded on steam distn crude oils showing for the years 1922 (Oct) and 1925 (Dec) the following values, resp yield 2 6, 2 4%, d_{15}^{15} 0 9221, 0 9223; α_D^{20} 2 5, 3 0 ; n_D^{20} 1.4634, 1 4640; soly in 70% alc 1 1 vol , % cineole 60, 56, phellandrene absent *Eucalyptus macarthuri* Sown in 1920 For the years 1923 (Mar) and 1925 (Aug) resp : yield 0 74, 0 5%, d_{16}^{16} 0.9257 -0 9256, α_D^{20} 3 5, 4 8 , n_D^{20} 1 4696, 1 4771; soly in 70% alc 1 2, 1 3 vol.; geranyl acetate 70 2, 61 9%, geraniol 6, 3%, eudesmol 16 2, 25 0% *E. radiata.*—Sown in 1918 For the year 1923 (Mar) · yield 2 7%, d_{15}^{15} 0 8884, α_D^{20} - 55 4°, n_D^{20} 1.4771, soly. in 80% alc 0 6 vol , piperitol ester 19 5%, piperitol 20% *E citriodora.*—For the years 1918 (May), 1919 (Oct), 1921 (Nov), 1925 (Aug), 1926 (May): yield 0.84, 1 00, 0 5, 0.61, 0 5%; d_{15}^{15} 0 8607, 0 8657, 0 8692, 0 8667, 0 8705; n_D^{20} 1 4498, 1 4515, 1 4536, 1 4558, 1 4547; α_D^{20} – –1, – 1 1, + 0, 0 85, 0 25°, soly in 70% alc. 1.2, 1 2, 1.2, 1.3, 1.3 vol ; citronellal 98, 95, 95, 90, 90% All the oils thus obtained were pale lemon to almost white and of aroma superior to that of ordinary com oils W. O. E

Cenomassa zyma. H ESCHENBRENNER *Pharm. Ztg* **71,** 1095 6(1926) —The use of this product (dry yeast ext) in the prepn of pills is discussed, notably of substances like creosote, salol, reduced Fe, etc The advantages peculiar to this mass lie in its non-friability and continued plasticity over a considerable period. W. O. E

Fontane in his relationship to pharmacy. GEORG URDANG. *Pharm. Ztg.* **71,** 1134-5(1926). W. O. E.

The Riedel family. GEORG EDMUND DANN. *Pharm. Ztg.* **71,** 1136–7(1926). W. O. E.

Portraits of German apothecaries. HERMANN GELDNER. *Pharm. Ztg.* **71,** 1137-9 (1926).— The portraits of Engelland and Linck are shown in connection with a list of some 60 apothecaries active during the 16th and following centuries. W. O. E.

Oriental styrax. O. ANSELMINO, R. SEITZ AND EMMA BODLÄNDER. *Arb. Reichsgesundh.* **57,** 162–72(1926).—A comparison of 15 samples of genuine styrax before and after the admixt. of adulterants with com. samples has demonstrated the value of the const. for the identification of styrax and the detection of adulterants. The following consts. were obtained: original styrax (Rhodos and Aidin): acid no (I) 45–61, sapon no. (II) 125–147, total cinnamic acid 14.6–19.0, free cinnamic acid 0.08–4.43, phenols 19.9–29.42, after dehydration by distn. with kerosene: I 64–80, II 178–195. After purification according to the German Pharm. V: I 56.4–65.3, II 163.1–168.2. The soly. in org. solvents was detd. by Sohxlet extn., evapn. and drying at 100°. When thus detd. the soly. in petroleum ether was 41–42%, but when an alc. soln. contg. large and varying quantities of water was shaken out with petroleum ether the soly. and the acid no. of the ext. increased with the water content up to 56.8% and 67.7, resp. On addn. of 30% colophony or turpentine the const. approached those of com. styrax very closely, showing an increase in I and a decrease in II and a remarkably low ratio of ester no. to acid no. Thirty % olive oil had the reverse effect. Most of the com. samples also leave a grease stain on paper, which is characteristic for the above admixts. A comparison with older analyses is difficult, since they refer to exts. and employ partly different and less satisfactory methods. MARY JACOBSEN

Further experiments on sputum disinfection. E. HAILER. *Arb. Reichsgesundh.* **57,** 703–15(1926); cf. *C. A.* **18,** 2733.—*B. tuberculosis* is completely killed by 4 hrs.' contact of 1 part sputum with 2 parts *alkalysol, parmetol, chloramine*, a 5% *Tb bacillol* soln. (a prepn. similar to alkalysol) and a 15% *chlorimide* soln. ($NCl(SO_3Na)_2$) contg. 7–8% active Cl. A 24-hr. contact permits considerable saving in disinfectant: 60–70% for alkalysol and Tb bacillol, 50% for chloramine, 60% for chlorimide. The undil., 15% chlorimide soln. is recommended for use in pocket expectorating cups, as it increases the sputum capacity from $^1/_3$ to $^1/_2$ of the total capacity. MARY JACOBSEN

Sterilization and standardization of opotherapeutic substances. BICE NEPPI. *Boll. chim. farm.* **65,** 449–56(1926).—Sterilization by heat, ultra-violet rays and chemicals may partly destroy the activity. Chemicals are not without danger to the patient, since, according to Pighini, minute doses of NaF, B_2O_3, SeO_3 and butyric and propionic acids affect the thyroid. Filtration through a candle is recommended. The filtrates are more active than the exts. deproteinized by acids or heat, more stable, perhaps owing to their high p_H (5.8–6.4) and have the original peroxidase content. The standardization should include the biol. assay, a detn. of ash and p_H, of I in thyroid, and a test for peroxidases, preservatives and org. foreign matter. MARY JACOBSEN

The soy bean as a source of important therapeutic and industrial products. ROMOLO VENTURI. *Boll. chim. farm.* **65,** 480–5(1926). MARY JACOBSEN

A new color reaction of mercuric salicylates and a few other substances. SILVIO GUGLIELMINETTI. *Giorn. farm. chim.* **75,** 169–73(1926).—Fractions of a mg. of mercuric (not mercurous) salicylates give with a drop of cold HNO_3 (d. 1.48) an intense violet, with ordinary concd. HNO_3-H_2SO_4 a reddish purple color which slowly turns blood red. Excess of Hg compd. and large samples must be avoided. The reaction is also positive with Hg *m*-hydroxybenzoate, and Hg methylsalicylate, negative with salicylic acid, its esters and salts, phenols and their substitution products, with other Hg compds. and naphthols. A soln. of 1 g. $Hg(NO_3)_2$ in 10 g. HNO_3 (d. 1.48) produces characteristic colors with the following compds.: Me salicylate, reddish violet; salol, intense violet; salacetol and salophen, like salol but less sensitive; anisic acid, faint violet; salicyaldehyde yellow, turning red and violet; salicin, yellow, rose, violet; β-naphthyl salicylate and aspirin, yellow. Most of the colors are destroyed by water and reducing agents, turn green with excess 10% NaOH, red with H_2SO_4 and are not altered by HNO_3 and HCl. MARY JACOBSEN

Contribution to the study of pharmaceutical preparations—lactic enzyme preparations. JACINTO PLACERES. *Rev. facultad cienc. quím.* **4,** 73–93(1926).—The following method for the detn. of activity of lactic enzyme prepns. (yoghurt and kefir) is superior to those generally applied (in France): One hundred cc. skimmed milk contg. 3% lactose, 50–70 g. glass beads and 1 cc. of the liquid or 0.5 g. of the solid prepn. are incubated 48 hrs. at 37°. The acid formed is titrated with NaOH and phenolphthalein. Most of the com. prepns., especially the solid ones, were inactive. Contamination by proteolytic enzymes was frequently encountered. The AcOH and HCO_2H production did not exceed the usual one. *Butyric acid* was found to be a decompn. product of fat. The sensitiveness of Berg's *lactic acid* test is 1:4000, that of Uffelmann's 1:2500. M. J.

Oil of fennel. B. N. RUTOVSKII AND L. G. TZYURIKH. *Trans. Sci. Chem. Pharm. Inst.* (Moscow) **1924,** No. 10, 69–70; *Chimie et industrie* **16,** 95(1926).—Extn. with Et_2O of fennel from Poltawa gave 7.41% of a mixt. of fixed and essential oils, which on steam

distn. gave 3.06% (presumably on the original fennel) of essential oil with d_{20} 0.9430, $[\alpha]_D$ 9.35°, n_D^{20} 1.5384, acid no. 0.94 A. PAPINEAU-COUTURE

Citrus oils. PEPPINO LIOTTA. *Profum. ital.* **3**, 340(1925); *Chimie et industrie* **16**, 95-6(1926).—Oils of known purity from the previous crops had: lemon d. 0.8643, $[\alpha]$ 60.5°, citral 4.5%; bergamot d. 0.882, $[\alpha]$ 14°, linalyl acetate 38%; mandarin d. 0.857, $[\alpha]$ 71°, methyl anthranilate 0.6%, Portugal d. 0.850, $[\alpha]$ 90.5°, aldehydes 1.3%; Seville orange neroli d. 0.8564, $[\alpha]$ 91.3°, aldehydes 0.9%; Seville orange petitgrain d. 0.9009, $[\alpha]$ 13°, esters 55.6%; lemon petitgrain d. 0.907, $[\alpha]$ 18°, citral 18-9%; mandarin petitgrain d. 0.890, $[\alpha]$ 11°, esters (as linalyl acetate) 53%; orange petitgrain d. 0.8854, $[\alpha]$ 37°, aldehydes 6.5%; neroli d. 0.8852, $[\alpha]$ 4.5°, esters (linalyl acetate) 4%; cedrate (*Citrus cedra*) d. 0.8692, $[\alpha]$ 60°, aldehydes 4%; lime (?) d. 0.8555, $[\alpha]$ 58°, aldehydes 12%. These values do not fall within the limits generally given for these various oils. A. PAPINEAU-COUTURE

Oil from the leaves and flowers of Dictamnus fraxinella Pers. B. N. RUTOVSKII AND I. V. VINOGRADOVA. *Trans. Sci. Chem. Pharm. Inst.* (Moscow) **1924**, No. 10, 71-5; *Chimie et industrie* **16**, 95(1926).—Steam distn. of flowers from plants grown in Crimea gave a 0.05% yield of oil with strong smell of anethole, and with d_4^{20} 0.9006, $[\alpha]_D$ 20.97° (in C_6H_6 soln.). The leaves gave a 0.15% yield of oil with the same odor and with d_D^{20} 0.9744, $[\alpha]_D$ +1.04°, acid no. 1.89, ester no. 34.15, Ac no. 43.33, sol. with slight turbidity in 3.7 vol. of 90% alc. and in 12 vol. of 80% alc., f. p. —2°. *Anethole* and *methylchavicol* were identified, and the former can be sepd. by cooling. Another sample obtained in 0.08% yield from a mixt. of leaves and flowers harvested toward the end of blossoming had d_{20} 0.9528, $[\alpha]_D$ + 3.57°, acid no. 1.72, ester no. 25.52, Ac no. 35.3 A. PAPINEAU-COUTURE

Seasonal variations in the cineole content of oil of eucalyptus. I. P. TIMOFEEV. *Trans. Sci. Chem. Pharm. Inst.* (Moscow) **1924**, No. 10, 99-100; *Chimie et industrie* **16**, 95(1926).—During 1919, on the 20th of each month 32 kg. of leaves were cut from 24 marked trees at Souchum (Caucasian district of the Black Sea), and distd., and the cineole content of the dried oil was detd. *via* Baker and Smith (the 165-85° fraction was considered as being cineole). The following results were obtained during the 12 months, starting with Jan.: 75.0, 74.7, 73.6, 69.7, 70.2, 46.2, 49.9, 57.0, 74.1, 57.1, 66.05, 65.0%. The min. occurs in June and the max. in Jan., probably on account of the temp. which facilitates the volatilization of the cineole. A. PAPINEAU-COUTURE

Some constants of oil of turmeric. B. N. RUTOVSKII AND P. P. LEONOV. *Troud. Naoutchn. Chim.-Farm. Inst.* **1924**, No. 10, 36-48; *Chimie et industrie* **16**, 95(1926).—*Oleum cinae* obtained in 1.03-1.42% yields, with loss of up to 9% of the santonin, had d_0^{25} 0.92111, $[\alpha]_D$ —3.19°, n_D^{25} 1.4650, acid no. 2.8, ester no. 12.1, cineole *via* Schimmel's resorcinol method 84.25%. Steam rectification caused a loss of 7.5% of cineole, and the rectified oil had d_4^{25} 0.9153, $[\alpha]_D$ - 2.64°, n_D 1.4627, acid no. 1.8, ester no. 12.3. The 0-85° fraction obtained on distn. contains a small amt. of *d*-pinene. A. PAPINEAU-COUTURE

Essential oil from the flowerheads of Perovskia atriplicifolia, Benth. M. G. RAO. *Quart. J. Indian Chem. Soc.* **3**, 141-7(1926).—A yield of 1% of oil on the wt. of dried flowerheads was obtained. It was light olive-green and had the following consts.: d_{30}^{30} 0.8943, n_D^{30} 1.4748; $[\alpha]_D^{30}$ 8.53°, acid value 0.2, ester value 30.4, ester value after acetylation 49.22. The oil is free from aldehydes and ketones and consists of about 50% of terpenes, among which *d*-α-pinene, β-pinene and camphene have been identified, 15-18% of alcs. and esters consisting mainly of *d*-borneol and bornyl acetate and the rest of sesquiterpenes consisting mainly of α-caryophyllene and aromadendrene. The combined acids consist almost entirely of AcOH. The oil may be of value as a source of *d*-borneol. Tables are given of the various fractionations and analyses made. R. C. ROBERTS

Determination of alkaloids in lupines. MACH. *Landw. Vers. Sta.* **104**, 226-31 (1925).—Sparteine is sepd. from lupinine by steam distn. and is detd. by pptn. with silicotungstic acid. The residue is mixed with gypsum, extd. with chloroform, treated with ether, and the ether soln. is shaken with 5% HCl, the acid liquid sepd. and the alkaloid finally pptd. with silicotungstic acid. F. M. SCHERTZ

Modern physico-chemistry and its pharmaceutical applications. W. A. WHATMOUGH. *Chemist & Druggist* **104**, 785, 854; **105**, 53, 168, 295, 364, 447, 539(1926); cf. *C. A.* **20**, 2389 S. WALDBOTT

A possible error in a test for subnitrate of bismuth prescribed in the German pharmacopeia. G. ROLLIN. *J. pharm. chim.* [8] **3**, 509-11(1926).—The $SnCl_2$ test

for *arsenic* may also indicate Te, but a certain sample free from As and Te gave a positive reaction, caused by traces of N_2O_5 present. Thus a sample after being heated in an elec. oven to 800°, and failing to react, gave a + result, rapidly, at 80° when 3 drops of HNO_3 were added to 0.8 g. of heated sample. This "false test" for As and Te is not produced if the N_2O_5 content of Bi_2O_3 is 10%, nor if the $SnCl_2$ reagent contains even a trace of $SnCl_4$. S. WALDBOTT

Pyrogenous oil of thuja. R. MASSY. *J. pharm. chim.* [8] **3,** 559–67(1926).—The differences existing between this oil, from the roots, stumps and trunks of the N. African *Callitris quadrivalvis* Ventenat, and that of Huerre (*C. A.* **20,** 2561), from the branches and leaves of *Thuja occidentalis* L., are tabulated. The N. African oil has d_{20} = 1.1 (Huerre, < 1), H_2O-sol. acidity 1–3.3 g. AcOH per 100 cc. (H., 0 6), and contains wood benzine b. below 150°, < 1% (H., 39%), tar oil b. 150–300°, 42–52%, contg. crude phenols, > 20%; residue of dry pitch, 40–50%; an oil volatile with steam, optical rotation > —20°. These tars resemble the Moroccan *arar* (*C. A.* **14,** 2983). Com. samples of thuja tar contained 1.20–4.50% of H_2O; 1 sample (through fraud, or faulty prepn.) 45.74%. S. WALDBOTT

Preparation of suspensions in oil of oxide and carbonate of bismuth for intramuscular injections. M. PICON. *J. pharm. chim.* [8] **4,** 5–11(1926); cf. Binet and Fleury, *C. A.* **20,** 1862.—Analysis of the contents of abscesses formed upon injection of olive-oil suspensions of hydrated Bi_2O_3 showed formation of a viscous, nonassimilable Bi soap. When $(BiO)_2CO_3$ is used (cf. P., *C. A.* **20,** 2227), no reaction with free fatty acid takes place. The use of lanolin mixed with the oil (French Codex) likewise seems harmful; olive oil alone suffices for suspensions. The dry Bi salt before being mixed with the oil should be bolted through a No. 200 silk cloth, and after mixing, strained through similar cloth. When $(BiO)_2CO_3$ is used, sterilization may be effected at 120°. S. WALDBOTT

Variations in the concentrations of pure commercial sulfuric acids, and necessity of using acid of density 1.84 in the sulfuric acid test of vaselines. F. RICHARD. *J. pharm. chim.* [8] **4,** 11–3(1926).—With 10 bottles of pure, com. H_2SO_4 from the same general lot, the sp. gr. varied from 1.817 to 1.843, corresponding to 89.56% (d. = 1.82) and 95.23% H_2SO_4. This uncertainty affects the testing of vaseline for purity (*C. A* **18,** 1732). "Vaselines suitably purified produce no appreciable coloration within 1 hr. when placed in contact with H_2SO_4 (d. 1 84), testing 95% of H_2SO_4." S. W.

Presence of barium chloride in the official calcium chloride. Directions for the detection of this impurity. F. RICHARD. *J. pharm. chim.* [8] **4,** 49–53(1926).—The $CaSO_4$ test of the Codex for Ba in $CaCl_2$ does not differentiate between $BaSO_4$ and $SrSO_4$ By means of the $SrCrO_4$ test, 3 com. samples showed, resp., 0 3857 0.4529 and 1.5040 g. of $BaCl_2 \cdot 2H_2O$ per kg. of $CaCl_2 \cdot 6H_2O$. The Ba content probably originated from the limestone of the Paris region, used in the Solvay manuf. of Na_2CO_3. A recent sample was free from Ba, but contained a trace of sulfate, probably caused by removal of Ba with H_2SO_4. S. WALDBOTT

Micrographic detection of tartaric acid in official preparations containing it. M FRANÇOIS AND C. LORMAND. *J. pharm. chim.* [8] **4,** 54–61(1926); cf. *C. A.* **18,** 703.—From any soln. contg. at least 0.150 g. tartaric (*A*) and less than 1 g. of citric acid per l., addn. of a concd. soln. of $Ca(AcO)_2$ (*C. A.* **19,** 1926) will ppt. characteristic crystals of $CaC_4H_4O_6$. Let stand for 3 days and apply to the ppt. (washed with 32% alc. and dried) Denigès color test (carmine-red on heating with H_2SO_4-resorcinol mixt. in boiling H_2O for 15 min.). To detect *A* in the *sirups and lemonades* of the Codex, they are first dild. with H_2O. In *sirup of* FeI_2, Fe is removed by pptn. with H_2S (NH_4SH and AcOH); excess of H_2S is destroyed by I followed by $Na_2S_2O_3$ In *wines, elixirs,* etc, sulfates are pptd. with $Pb(AcO)_2$ followed by Na_2CO_3. From *Seidlitz water,* $MgSO_4$ is removed by pptn. with $BaCl_2$ followed in the filtrate by Na_2CO_3. *Powder of* $HgCl_2$ *and A* is put into H_2O, its indigo is destroyed by adding HCl and NaClO; then Hg is pptd. with KI and several portions of Zn. Add slight excess of NH_4OH and filter. Sketches are shown of crystd. Ca tartrate, and Ca and Mg citrates. S. WALDBOTT

Polarimetric examination of oil of cade. R. MASSY. *J. pharm chim.* [8] **4,** 61–5 (1926).—The optical rotations of dephenolated, steam-distd. tars of roots, trunks and branches of *Juniperus oxycedrus* (*A*), *J. phoenicea* (*B*), *J. thurifera* (*C*) and *Pinus halepensis* (*D*) are detd. and tabulated. True oil of cade, from the *trunk* of *A*, is decidedly *l*-rotatory, confirming Huerre (*C. A.* **20,** 2561) and M. (*C. A.* **17,** 888). The oil from branches of *A* is optically little active, that from roots, giving only a small yield (3.06%), has + rotation. The oils of *B* and *C*, being *l*-rotatory, cannot be differentiated from true oil of cade by optical rotation. *D* yields a faintly + product;

but the tar of *Cedrus atlantica* is the only one of this series that may be identified by its decidedly + optical rotation. S. WALDBOTT

Assay of oil of cade. R. HUERRE. *J pharm. chim.* [8] **4,** 65-6(1926).—H. reaffirms the authenticity of 4 samples (*C. A.* **20,** 2561), which was doubted by Massy (cf. preceding abstr.) on account of the high values of their negative optical rotation. These oils gave the *l*-cadinene-2HCl test, thus far considered characteristic for true oil of cade. H. suggests that this test be applied by M to his *l*-rotatory oils from *B* and *C*. S. WALDBOTT

Cacodylate of strychnine. J. BOUILLOT. *J. pharm. chim.* [8] **4,** 145-56(1926).—This substance, introduced by Eysseric in 1902 as a remedy in tuberculosis, is not a chem. compd , but an approx. equimol. mixt. of its 2 components. B. was unable to effect their chem combination Com. samples showed excess of either cacodylic acid or strychnine (cf. Lemaire, *C A.* **5,** 2899); hence this prepn. should not be used in therapeutics S. WALDBOTT

Comparison of the results of assay of the different cinchona preparations. E. LEGER. *J. pharm chim* [8] **4,** 156 63, 193-201(1926) —In view of reported large losses in alkaloid in the making of galenical prepns of cinchona barks (cf. Barel, *C. A.* **20,** 1302), L detd the exact alkaloidal content by wt and by titration of powd. red and yellow barks, as well as of the galenicals prepd. from these by the Codex methods, slightly modified when required With both the red and the yellow barks, the wt. of crude alkaloids in 100 g of non-dried powder contg about 9% H_2O proved to be equal to the quantity of pure alkaloids detd. volumetrically (hematoxylin) from the same powder dried at 100° The non-dried powders of red and yellow barks contained, resp., 8.20 and 4.20% total alkaloids The various prepns from these barks had the following alkaloidal contents *Red bark* —Fluidext , Codex, 7% (loss 14 63%); fluidext. with resin, 7.40% (loss 9.75%); tincture, 1 061% (loss 35.12%); soft ext (yield 17 50%), 10.84% (loss 76 86%); (red) wine of cinchona, 0 1175% (loss 42.67%); white wine, 0 105% (loss 48 77%). *Yellow bark* —Dry ext (yield 23 60%), 13.76% (loss 29 39%); fluidext., 3 84% (loss 16 52%). The relatively small losses of alkaloid in the fluidexts , and the large loss in the soft ext of the red bark prepd. by extn with H_2O (the yellow bark with 60% alc), are notable. An increase in the Codex requirements for total alkaloids of the red bark to 5-7%, for those of fluidext. to 4-5%, and of soft ext. to 6-8% is recommended S. WALDBOTT

Laurent Lafay (1861-1926). M. G *J. pharm. chim.* [8] **4,** 189-91(1926).—An obituary. S. WALDBOTT

Louis Sonnié-Moret (1855-1926). J. B. *J. pharm. chim.* [8] **4,** 236(1926).—An obituary. S. WALDBOTT

Emile Luce (1887-1926). M. FRANÇOIS. *J. pharm. chim.* [8] **4,** 283-4(1926) —An obituary. S. WALDBOTT

Emulsions and their preparations, a colloid-chemical study. E. ISELIN. *Pharm. Acta Helv.* **1,** 45 55, 81-8(1926) -On the basis of theoretical and practical considerations, a permanent and palatable 50% cod-liver oil emulsion is prepd. as follows: Melt in a beaker palmitic acid 1 5 g , stir in *N* KOH 8 0 while heating, add drop by drop mucilage of gum arabic 20 0, continue heat and agitation and add a soln. of gelatin 0.5 in 40.0 of H_2O A white, homogeneous soap magma results. Add drop by drop, while stirring, a mixt of cod liver oil 100 0, and oils of cinnamon and cloves, 4 drops each, previously heated in a 500 cc round-bottom flask by immersion in boiling H_2O. Finally add simple sirup 30 0 g contg tincture of orange peel 3.0 g. Put the yellowish white emulsion back into the bottle, immerse twice in boiling H_2O for a short time, always shaking well, finally put the flask into cold H_2O. A perfect emulsion is thus obtained. References to literature are given abundantly. S. WALDBOTT

Electrometric determination of the hydrolysis of caffeine citrate. C. MORTON. *Pharm. J.* **116,** 78-80(1926).—Caffeine citrate (*A*) in abs. EtOH soln. is a true compd. but is almost completely hydrolyzed in aq. soln , even if satd. The theory and the exptl. details and results of electrometric measurements are given, with line drawings of app. used, and the following conclusions are reached. (1) The electrometric method is suitable for the detn. of the basic strengths of alkaloids and the degree of hydrolysis of alkaloidal salts. It should prove of especial value for the stronger alkaloids, such as strychnine, in which the degree of hydrolysis of the HCl salt is slight. In such cases, since the H-ion concn. is minute, the polarimetric and colorimetric methods do not yield accurate results. However, complications may arise in alkaloids which are converted into dihydro derivs by molecular H in the presence of Pt black. (2) The dissocn. const. of caffeine is $K_b = 6.8 \times 10^{-13}$. The hydrolytic dissocn. of salts of caffeine with strong acids does not follow the simple diln. law, and a careful investi-

gation of the anomaly should yield interesting results. (3) The hydrolytic dissocn. of *A* is practically complete even in satd. soln. Since the salt in soln. is completely decomposed into free caffeine and acid, *A* should offer no advantage over the alkaloid itself for pharmaceutical use, while the citric acid formed by hydrolysis is a frequent cause of incompatibility in dispensing. Hence, as pointed out by Squire, the use of *A* in pharmacy is to be condemned. S. WALDBOTT

Determination of the basic constant of morphine and its application in the titration of morphine. C. MORTON. *Pharm. J.* **116**, 567–70, 593–7(1926); cf. preceding abstract.—A formula for the basic const. of morphine is developed, and the electrometric method of the detn. of the H-ion concn. of morphine-HCl solns. is described in detail, with line drawings of app. used. The theory of indicators is applied to the titration of morphine. On theoretical grounds, the accepted methods of titrating morphine cannot be expected to yield accurate results, and this conclusion is fully borne out by expt. The error in direct titration is greatest when litmus and cochineal are used as indicators, less with Me orange, and least with bromophenol blue (cf. Evers, *C. A.* **15**, 3893). Under suitable conditions, however, each of these indicators may be made to yield satisfactory results. The basic const. of morphine at 30° is K_b = 6.27×10^{-9}. Unlike the weaker alkaloids, such as caffeine, the hydrolysis of the HCl salt in aq. soln. varies in strict accordance with the law of mass action. S. W.

The Pharmacological Laboratories. ANON. *Pharm. J.* **116**, 205–6(1926).—This institution, under the auspices of the Pharmaceutical Society of Gt. Britain, is a central testing station for the physiol. examn. of (1) aq. ext. of the posterior lobe of the pituitary gland, (2) digitalis, strophanthus and squill and (3) ergot, according to the international standard methods (Geneva Conference, 1925). **Opening of the Pharmacological Laboratories, June 16, 1926.** *Ibid* **116**, 642–6.—An account of the proceedings; with photographs, including those of biol. testing app. Also in *Chemist & Druggist* **104**, 829–32(1926). S. WALDBOTT

Note on thyroid extract and potassium permanganate. J. J. BLACKIE. *Pharm. J.* **116**, 229–31, DRYERRE. *Ibid* 240–1; *Chemist & Druggist* **104**, 306–7(1926).—A discussion on the best mode of dispensing this possibly incompatible mixt. recommended by Nott (*C. A.* **19**, 3113; **20**, 1272). The mixt. is permanent when kept in a dry bottle, but in presence of H_2O, a reaction takes place at once, although no I is set free. In discussion, D. questioned the clinical necessity of the use of $KMnO_4$, also, whether the physiol. action of thyroxin fully explained the function of the thyroid gland. S. WALDBOTT

The British pharmacopeia: Criticisms and suggestions for future editions. F. G. HOBART. *Pharm. J.* **116**, 328–30(1926).—Many brief comments are made; certain new tests are recommended, *e. g.*, for free Cl (with KBr and $CHCl_3$) in Liq. ferri perchlor., owing to new modes of manuf. S. WALDBOTT

Ointments. IVY ROBERTS. *Pharm. J.* **116**, 336(1926).—Abstract of a lecture on difficulties in the prepn. of ointments, and modes of overcoming them. S. W.

The Pharmaceutical Institute of the University of Basel. H. G. GREENISH. *Pharm. J.* **116**, 598–602(1926).—A descriptive account, illustrated. S. WALDBOTT

Determination of morphine in poppy extracts. C. T. BENNETT AND D. C. GARRATT. *Pharm. J.* **117**, 149, 208; *Chemist & Druggist* **105**, 235(1926).—The morphine content of poppy capsules varies from 0.16 to 0.28%. The Brit. Pharm. method for the assay of opium cannot be applied to poppy exts., as direct treatment with lime yields an unwieldy magma. A method is given by which the ext. is first exhausted with Me_2COH, the solvent distd. off, the residue treated with milk of lime, and after filtering, an aliquot part is treated similarly to the Brit. Pharm. assay method for morphine. The results by this method agree well with those obtained by the method of Tickle (*C. A.* **1**, 1455) and, for opium and its tincture, with those obtained by the Brit. Pharm. process. The standard suggested for the liquid extract of poppy is 0.20 g. morphine per 100 cc. S. WALDBOTT

A reaction between lead subacetate and phenol. G. A. MEDLEY. *Pharm. J.* **117**, 149–50, 209; *Chemist & Druggist* **105**, 256(1926).—An 8% aq. soln. of PhOH gave with $PbO.Pb(AcO)_2$ (not with $Pb(AcO)_2$) a white ppt., probably $(PhO)_2Pb$, sol. in 50% alc., acetone, C_6H_6, $CHCl_3$ and Et_2O, also in dil. AcOH. Many other phenols gave similar ppts., all (except with pyrogallol) sol. in AcOH. Phenols with more than 1 free OH group yielded ppts. insol. in $CHCl_3$. In dispensing, pptn. is best prevented by adding a few drops of dild. AcOH. S. WALDBOTT

Use of carbon tetrachloride in pharmacy. G. E. TREASE AND H. TINGEY. *Pharm. J.* **117**, 150–2, 210; *Chemist & Druggist* **105**, 257–8(1926).—CCl_4 may be used for the prepn. of certain oleoresins, but its only advantage over the solvents now in use seems

to be its non-inflammability. It is inferior to other solvents for alkaloids except in case of cocaine (soly. 31.94: 100 g. at 20°). The soly. of I in CCl_4 increases rapidly with temp. (34.22 g. per l. at 30°, 130.10 g. at 77°). Like $CHCl_3$ and CHI_3, CCl_4 gives characteristic colors with *o*- and *m*-phenol derivs., but unlike these, not with *p*-cresol, eugenol and β-naphthol. The colors produced in the case of CCl_4 are probably due to dyes of the aurin type. S. WALDBOTT

The new German pharmacopeia, 6th ed. ANON. *Pharm. J.* **117**, 415–8(1926).—A detailed review; "the qual. and quant. chem. tests have all been arranged with the express purpose of saving time and material." S. WALDBOTT

Burkhardt Reber, Pharmacist, 1848-1926. "V." *Schweiz. Apoth. Ztg.* **64**, 310–1 (1926).—An obituary. S. WALDBOTT

Insect powder. L. REUTTER. *Schweiz. Apoth. Ztg.* **64**, 341–4(1926).—A review of the isolation and the chem. and phys. properties of the active principles of insect powder. S. WALDBOTT

The new German Pharmacopeia. L. ROSENTHALER. *Schweiz. Apoth. Ztg.* **64**, 457–61(1926).—A detailed review of the new features of the 6th edition. S. W.

Silver protein preparations. ANON. *J. Am. Med. Assoc.* **87**, 430(1926).—The U. S. P. X classifies the Ag prepns. and provides standards. The Chem. Lab. Am. Med. Assoc. examd. all of the Ag prepns. described in the N. N. R. to ascertain whether they complied with the standards of the U. S. P. X. The chief U. S. P. criteria for the control and purity of these prepns. are Ag content and yeast fermentation inhibition (cf. Peterson, *C. A.* 20, 3332). The prepns. examd. and their detd. Ag content were proganol 8.7%; protargentum 8.6; protargol 8.4; argyn 26.3; argyrol 19.4; cargentos 20.2; silvol 19.9; solargentum 19.5 and vargol 21.8%. All of the prepns. passed the yeast test except cargentos, which was slightly stronger than the standard, and vargol, which was 8 times too strong. The latter product was withdrawn by the maker and another that was promised to conform to the U. S. P. standard was placed on the market. L. E. WARREN

The microtitration of iodides with iodate and the determination of the iodide and ferrous iron content in syrup of ferrous iodide. I. M. KOLTHOFF. *J. Am. Pharm. Assoc.* **15**, 164–6(1926).—To 10 cc. of a 0.1 *M* soln. of KI are added 80 cc. of H_2O, 20 cc. of 25% HCl and 4–5 cc. of 10% KCN. The titration is then completed by $^1/_{60}$ *M* (or weaker) KIO_3 soln., with CCl_4 or $CHCl_3$ as indicator. The results are accurate even in the presence of large quantities of RBr. The method is accurate to 1% in solns. contg. 0.127 mg. of I in 100 cc. In mixts. contg. other substances oxidized by RIO_3 the method is reversed, the I being oxidized to RIO_3 by hypochlorous acid and the I titrated with KI. By this method the accuracy was 1% on 0.1 mg. in 100 cc. The method is not applicable for the assay of syrup of FeI_2. For this assay 10 cc. of the liquid are dild. with 80 cc. of H_2O, 10 cc. of 25% H_3PO_4 and 5 cc. of 10% KCN. Then 0.1 *N* $KMnO_4$ is run in until the liquid is colored faintly pink. Then an excess of KI is added and the liberated I titrated with $Na_2S_2O_3$. Both the I content and the FeI_2 may be calcd. L. E. WARREN

The stability of official pepsin preparations. H. W. VAHLTEICH. *J. Am. Pharm. Assoc.* **15**, 193–6(1926).—Various pepsin prepns. were made up from the same lot of granular pepsin with varying quantities of HCl and purine derivs. and their stabilities were studied. A portion of the original pepsin was kept and was assayed each time that the prepns. were. This suffered no loss in 2 yrs. Caffeine, theobromine, theobromine-Na salicylate and uric acid were the purines used. Glycerite of pepsin N. F. IV keeps very well while elixir of pepsin lost its entire activity. The presence of purines does not enhance the keeping properties much. The p_H of the elixirs of pepsin is close to the optimum for enzyme activity. This suggests that the enzyme may digest itself or its carrier. L. E. WARREN

The volatile oil of Ledum groenlandicum. E. V. LYNN, ARNOLD LEHMAN AND RUSSELL CAIN. *J. Am. Pharm. Assoc.* **15**, 263–5(1926).—*Ledum groenlandicum*, or Labrador-tea, gives 0.013% of a volatile oil on distn. with steam. Very little oil is found in the stems. The plant relatively free from stems gave 0.035% of oil, $d_{21.2}$ 0.8998, n_D 1.4917. The oil was fractionated between 166° and 310° and the several fractions were examd. in as much detail as the limited quantity permitted. There is very little ledum camphor or other stearoptene present. Limited amts. of phenols and aldehydes as well as sesquiterpenes and azulene are present. L. E. WARREN

Extracts of aconitum columbianum. O. A. BEATH. *J. Am. Pharm. Assoc.* **15**, 265–6(1926).—Specimens were collected in 2 periods of growth, *i. e.*, in the pre-flowering stage and in the full-flowering state. The specimens were assayed for alkaloids by the U. S. P. IX method for aconite. The results were: tubers (flowering) 0.839; tubers

(young plants) 0.774; above-ground (flowering) 0.350; above-ground (young plants) 0.758. Fluidexts. were prepd. from the several portions of the drug and the toxicity of each was detd. by the biol. method. All were relatively non-toxic. L. E. WARREN

The determination of the amount of oil in spirit of peppermint. C. V. NETZ. *J. Am. Pharm. Assoc.* **15**, 278–9(1926).—LaWall's and Forman's method (*C. A.* **8**, 784) was tested on known samples made without herb. The method gave results within 0.1% of the truth. Samples made strictly according to the U. S. P. gave but 9.8% of oil or 98% of the truth. N. concludes that some oil is lost in the herb and on the filter in the U. S. P. mfg. process. Since the U. S. P. does provide for an assay of the spirit, a specimen assaying 98% of the theoretical amt. of oil is U. S. P. in strength. Of 33 market specimens assayed by N. 4 or 5 were of good quality. L. E. WARREN

The melting point of sodium phosphate U. S. P. H. F. HILDEBRANDT, R. E. SCHOETZOW AND P. M. GIESY. *J. Am. Pharm. Assoc.* **15**, 432–3(1926).—Na phosphate U. S. P. is the dodecahydrate. The U. S. P. states that when heated to about 40° the salt fuses, yielding a colorless liquid. The authors show that this statement is without significance. The dodecahydrate is not stable above 36°. At this temp. it changes to a mixt. of heptahydrate and H_2O. The H_2O dissolves most of the heptahydrate, a liquid being formed. On cooling the heptahydrate crystallizes. This combines with the balance of the H_2O, forming a solid cake. The pharmaceutical remedy is to market the heptahydrate $Na_2HPO_4.7H_2O$ which is stable up to 48°. L. E. WARREN

Diethyl phthalate. IV. J. A. HANDY AND L. F. HOYT. *J. Am. Pharm. Assoc.* **15**, 454–61(1926). Continuation (*C. A.* **17**, 853; **19**, 152, 3001.)—Heating the mixt. to 150° for 3 min. for the formation of fluorescein was most satisfactory. The EtOH soln. of KOH must be free from aldehydes. To 0.1 cc. (usually 5 small drops) of sample in a small beaker, add 1 cc. of EtOH-KOH. Heat on a steam bath until the EtOH is completely removed. From a graduated pipet add 0.5 cc. resorcinol-H_2SO_4 reagent, rotating the container so that the acid thoroughly wets the entire residue and heat for 3 min. in an oil bath at a temp. not over 150°. Cool and pour the reaction mixt. into 40 cc. of distd. H_2O in a small flask. Make alk. with 10 cc. of 10% NaOH soln. A yellowish green fluorescence persistent for 24 hrs. and longer is proof of the presence of diethyl phthalate or some other phthalate in the sample. The test was applied to 25 perfume substances, 7 of which responded to the test. Samples which contd. the diethyl phthalate were seen to give a ppt. of K phthalate in needle-like crystals a few min. after the material had been placed on the steam bath. Under the conditions the cryst. test is given when 0.005 g. of diethyl phthalate is present, and in some volatile oils when only 0.002 g. are present. The test (*A*) is given: To 1 cc. of perfume in a small beaker add 1 cc. EtOH-KOH. Evap. slowly with gentle heat and observe frequently, holding the beaker in front of a light. Provided the 1 cc. sample used contains 5 mg. or over of diethyl phthalate (*i. e.*, 0.5% and in many cases if only 2 mg. are present) the characteristic silky, needle-like crystals of K phthalate will be seen to form in the soln. If no characteristic crystals form, it is proof that some EtOH other than 39B or 39C has been used in the manuf. of the perfume. If no crystals form by test *A*, repeat, using 10 cc. of sample and 1 cc. of EtOH-KOH. Evap. and observe as in test *A*. If the sample contains 5 mg. or more of diethyl phthalate (*i. e.*, 0.05%), crystals of K phthalate form. This method is simple, rapid and sensitive. It is applicable directly to essential oils, perfumes, denatured alcs. and other H_2O-free liquids and may be applied to the petroleum ether ext. products such as toilet water and beverages. Results of its application to a great no. of essential oils, perfume ingredients and perfumes show that it will detect with certainty 5 mg. (and often as small an amt. as 2 mg.) of diethyl phthalate in a 0.1 cc. portion of essential oil or in a 10 cc. portion of perfume. L. E. WARREN

A note on the assay of solution of arsenious and mercuric iodide. WILMER H. SCHULZE. *J. Am. Pharm. Assoc.* **15**, 464–5(1926).—The AsI_3 content of a solution of arsenious and mercuric iodide undergoes a rapid change on keeping. This change appears to be much accelerated by exposure to light. The present U. S. P. method for detg. the AsI_3 content is unreliable and should be changed to a detn. of the total As present. L. E. WARREN

Ephedrine and pseudoephedrine, their isolation, constitution, isomerism, properties, derivatives and synthesis. K. K. CHEN AND C. H. KAO. *J. Am. Pharm. Assoc.* **15**, 625–39(1926).—Ephedrine and pseudoephedrine are isomeric alkaloids obtained from *Ephedra vulgaris* var. *helvetica*. From the literature it seems probable that the levo variety is found in the plant when grown in China and pseudoephedrine in the European plant. The base is oily but crystallizes on standing; m. 39–40°; the HCl salt m. 214–6° and is optically active; α_D 34.96. The Pt salt m. 184–6°; Ag salt golden

crystals m. 128–31°; HI salt m. 155–6°; the sulfate m. 235–6°. Many other salts and esters were prepd. and their properties described. Ephedrine had been synthesized previously. L. E. WARREN

Analysis of emulsions of cod-liver oil and malt extract. C. S. WAGGONER AND C. C. GLOVER. *J. Am Pharm. Assoc* **15**, 754–5(1926).—Methods for the analysis of C. L. O emulsions are unreliable because the oil gains in wt on heating; also the most suitable solvent had not been ascertained. Expts indicated that the oil would gain about 10% of its wt on heating The solvents tried were Et_2O, petr benzine (30–60°), CS_2, $CHCl_3$ and EtOAc Et_2O and petr benzine were the most satisfactory solvents tried and EtOH was best for breaking the emulsions. Add 15 cc of H_2O to 4–6 g of the emulsion and stir Add 50 cc of EtOH and shake until the emulsion breaks; then add 50 cc of petr benzine and shake. Repeat the shaking out process 4 or 5 times. Evap the solvent and dry the residue over H_2SO_4 The method was applied to known and com samples The results on the known samples were a little low; *e. g.*, on a 20% emulsion (by wt) a correction of 0 5% brings the value about true Com. emulsions of cod-liver oil and malt contain about 20% of oil L. E. WARREN

A note on the ephedrine content of ephedra vulgaris var. helvetica. PETER MASUCCI AND KO SUTO *J Am Pharm. Assoc* **15**, 758(1926) —The ephedrine content of this drug has been reported by Chen (*C A* **19**, 2863) as from 0 018 to 0 091% A specimen of the identified drug gave 0 305 and 0 298% by 2 different analysts Three fluidexts were made from the drug These assayed 0.312, 0 462 and 0 306 g of alkaloid per 100 cc L. E. WARREN

Stability of hexylresorcinol in pharmaceutical preparation. WM A. FEIRER AND VEADER LEONARD *J. Pharmacol* **28**, 395–7(1926) —Hexylresorcinol, in soln in olive oil enclosed in sol gelatin capsules, does not deteriorate on standing for 1 year at room temp C J WEST

German ethereal flower extract oils. W. TREFF, F. RITTER AND H WITTRISCH. *J prakt Chem* **113**, 355 60(1926); cf. v. Soden, *C A* **19**, 3147 —Violet leaves (*Viola rossica* var. "*Konigin Charlotte*") gave 0 0166% of ethereal oil, d_{15} 0 912, acid no. 52, ester no 76 1, Ac no. 172, optically inactive. The garden nettle, *Dianthus caryophyllus* L, gave 0.0498% oil, d_{15} 1 010, $[\alpha]_{D100}$ – 0°36′, acid no. 28, ester no 132, Ac no. 249 The flowers of the jasmine (mixt. of several varieties) gave 0 06% oil, d_{15} 0 947, $[\alpha]_{D100}$ 0°, acid no 28, ester no 73, Ac no 224 The yellow lupine flowers (*Lupinus luteus* L) gave 0 0195% oil, d_{15} 0 900, $[\alpha]_{D100}$ 7°30′, acid no. 38, ester no 31, Ac no 143 Broom flowers (*Genista tinctoria* L) gave 0 0364% oil, with d_{15} 0 9335, $[\alpha]_{D100}$ - 9°10′, acid no. 18, ester no. 35, Ac no. 156. C. J. WEST

Butternut oil [as therapeutic agent] (U. S. pat. 1,602,004) **27.** Drying tobacco (U. S. pat. 1,567,031) **13.**

1-Methoxymethyl-3,7-dimethylxanthine. FARBENFABRIKEN VORM. F. BAYER & CO. Brit 242,296, Oct 29, 1924 Theobromine or its salts is treated with chloromethylether. Its physiol action resembles that of caffeine and it forms double compds with salts of org acids such as Na benzoate and Na salicylate.

Cholesterol esters. SOC ANON POUR L'IND. CHIM. À BÂLE. Brit. 243,510, Nov. 7, 1924. Therapeutic esters are prepd from cholesterol and phenylpropiolic, crotonic, tetrolic, or α-benzylidenepropionic acid or similar acids Their therapeutic activity is increased by using them in soln with phenylacetylene and camphor.

Anthelmintic. FARBENFABRIKEN VORM. F. BAYER & CO. Brit. 243,325, Nov. 21, 1924. Latex either coagulated or uncoagulated, of *Ficus glabrata* or *Ficus doliaria*, is extd. with petroleum ether or other suitable org. solvent so as to leave an active anthelmintic substance as a residue

Medicated pastiles. KNOLL & CO. Brit. 242,323, July 4, 1924. Camphor, santal oil, ethereal oils, alkaloids and brominated or iodized fats or other medicines insol in aq mixts. of glycerol and gelatin are dissolved in anhyd. mixts of glycerol and gelatin to form pastiles which may be rendered tasteless with a layer of non-medicated gelatin and may be treated with CH_2O to prevent digestion until they reach the intestine.

Mercury thiocyanogen compound. O. NEUBERT, K. SCHRANZ and G. WESENBERG. U. S 1,602,777, Oct. 12. A sol. colloidal Hg thiocyanogen compd. which may be used in ointments is prepd. by treating solns. of Hg salts, *e. g.*, Hg acetate, with solns. of thiocyanates such as KCNS in the presence of albumose or other protective colloid.

Organic mercury compounds. FARBENFABRIKEN VORM. F. BAYER & Co. Brit. 243,361, Nov. 21, 1924. The Hg compd. of *o*-nitrophenol is dissolved in dil. NaOH soln , mixed with an aq. soln. of albumose, neutralized with dil. HOAc and pptd. with acetone. An aq. Hg acetate soln. is treated with dextrin and PhOH and pptd. with concd. alc. Mercurized *o*-chlorophenol may be similarly treated. Products thus prepd. are used in medicine and as *plant-protecting media, e. g.*, for immunizing grain

Picrates of local anesthetics. F. K. THAYER. U. S. 1,596,259, Aug. 17. Antiseptic anesthetic compns. suitable for treating burns and other skin lesions are prepd. by reaction of picric acid with 3 mol. proportions of a local anesthetic in a solvent such as H_2O, alc or C_6H_6. The picric acid salt of *n*-butyl-*p*-aminobenzoate m. 109-10°; the picric acid salt of ethyl-*p*-aminobenzoate m 120-1°; the picric acid salt of methyl-*m*-amino-*p*-hydroxybenzoic acid m 221-2° (decompn); the picric acid salt of diethylaminoethyl-*p*-aminobenzoate (procaine picrate) m 133–4°; the picric acid salt of di-*n*-butylaminopropyl-*p*-aminobenzoate m. 85–8°. These compds. are well dild with unguents for local use

Toxin and antitoxin of scarlet fever. G. F. DICK and G. H. DICK. Brit. 243,675, Nov. 28, 1924.

Tamponing wounds. R. VOGEL. U. S. 1,593,814, July 27. Blood is mixed with Na citrate or other non-poisonous material which delays coagulation to such an extent that the blood is approx in a state of unstable equil with regard to its coagulating quality, a substance such as $CaCl_2$ is subsequently added to cause the blood to coagulate rapidly and prior to its coagulation, the blood is applied to a wound.

18—ACIDS, ALKALIES, SALTS AND SUNDRIES

FRED C. ZEISBERG

Mechanism of the formation of sulfuric acid in the lead-chamber process. ANDRÉ GRAIRE. *Chimie et industrie* **16**, 3 15, 181 9(1926); cf. *C. A.* **18**, 3454; **19**, 1231, 1675, 3148.—A discussion of the improbability of the formation of so-called intermediate compds , of the nature of the oxidation reactions of SO_2, and of the effects of the concn. of SO_2, N oxides, O_2 and H_2O in the gases, of the nature of the nitrous gases, of temp , of the rate of flow of the gases, and of the elimination of H_2SO_4 from the reaction by pptn. Bibliography of 24 references. A. PAPINEAU-COUTURE

The absorption of gaseous hydrogen chloride by sulfuric acid. VÁCLAV ČUPR. *Spisy Vydávané Přírodovědeckou Fakultou Masarykovy Univ* **1925**, No. 63, 3–17.—The soly. of HCl in 77-100% H_2SO_4 solns. was measured at 25°, with a special app. There was a min of 92 mg. HCl per 100 g H_2SO_4 soln. at 89% H_2SO_4, the soly. at 76% being 350 mg. and at 100%, 400 mg. Measurements were also made between 9 and 83% H_2SO_4 at 0°, 21 and 72% at —15.8° and 33 and 69% at —25°. The results are con ordant among themselves and with those of Coppadoro (cf. *C. A.* **5**, 1022). F. C. Z.

[illegible]e absorption of hydrogen chloride and sulfur dioxide [illegible] acid [illegible]

[illegible] and 62°. The results agree well with those of earlier investigators. There is a min soly. of both HCl and SO_2 in H_2SO_4 solns near the hydrate $H_2SO_4 \cdot H_2O$, with a less pronounced min. as the temp. rises This min. disappears around 60–65°. CH_3COOH, which is known to form no hydrate, does not exhibit such a min. F. C. Z.

The stability of constant-boiling hydrochloric acid. J. A. SHAW. *Ind. Eng. Chem* **18**, 1065–6(1926).—Samples of const.-boiling HCl prepd. by distn. and stored for over 3 years were found to have changed less than 0.1% from a sample freshly prepd. F. C. Z.

Potash. J. W. TURRENTINE. *Mineral Ind.* **34**, 579–89(1925).—A review of the domestic and foreign industry. A. B.

Experiences in filtering solutions in the potash industry. HANS SCHILLBACH. *Chem App.* **13**, 189-90, 209–12(1926); 8 cuts.—An account of work with the Kelly filter-press and the Wolf cell filter and plate filter. J. H. MOORE

Modern examination of alkali deposits with help of an electrical method. H. HUNKEL. *Kali* **20**, 1–3(1926).—The content is detd. by measuring the resistance

of the soln. at the bottom of a borehole with electrodes connected to an alternating-current Wheatstone bridge. L. A. PRIDGEON

Large pots and boilers for the manufacture of soda. ANON. *Krupp. Monatsh.* **7,** 159-61(1926); 7 illus.—Cast-iron pots and boilers are shown of 249-cm. diam., 5-cm. wall, 442-cm. height. C. G. F.

Sodium salts. A. G. WIKOFF. *Mineral Ind.* **34,** 637-48(1925).—Discusses production and imports of nitrate, salt, carbonate and sulfate. A. B.

Sodium compounds in commerce. H. M. BATTERS. *Chem. Met. Eng.* **33,** 553-6 (1926).—The methods used in the U. S. A. in the production and sales distribution of $NaClO_3$, $Na_2Cr_2O_7$ and $NaNO_2$ are outlined. There are few domestic producers. W. H. BOYNTON

Production and uses of hydrogen peroxide. WESHING. *Continental Met. Chem. Eng.* **1,** 13-6(1926).—A brief review. W. H. BOYNTON

Efficacy of stabilizers used in the preservation of hydrogen peroxide. J. CHARTIER. *J. pharm. chim.* [8] **3,** 515-59(1926).—The best preservatives are AcNHPh (ratio 0.1 g. per l.; loss in strength per yr. 4.92%) and BzOH (0.1 g. per l.; loss 5.67%), then follow the less applicable uric acid (0.1 g. per l., loss 10.31%) and tannin (0.1 g. per l., loss 14.21%). The use of yellow glass is a further aid in the preservation of H_2O_2. S. WALDBOTT

The production of iodine in Chile. J. B. FAUST. *Ind. Eng. Chem.* **18,** 808-11 (1926). E. J. C.

The natural and industrial compounds of sulfur. LUCIEN MANGÉ. *Rév. industrielle,* Aug., Sept. and Oct. 1925, *Génie civil* **88,** 48(1926). J. J. H., JR.

Manufacture of sulfur from sulfurous gas obtained as a by-product in refining metals. II. N. F. YUSHKEVICH AND V. A. KARZHAVIN. *J. Chem. Ind.* (Russia) **2,** 719-26(1926); cf. *C. A.* **20,** 3335.—Theoretical considerations show that in reducing SO_2 by C the reaction must be almost complete and the temp. must have practically no influence when the equil. is reached; at 700° a considerable amt. of CO_2 must be formed which rapidly decreases with the rise of temp., and at 1100° the gaseous mixt. should contain only 0.15% CO_2 and 79.8% CO, a further increase of temp. having no influence on the compn. of the gaseous phase. Experimentally this reaction has been studied by using coke and birch charcoal as reducing agents, whereupon it was found that in spite of the use of catalyzers the equil. of the reaction cannot be reached quickly enough to permit the verification of theoretical considerations. The expts. only gave the relative speeds of reduction of SO_2. When charcoal is used the reaction begins at 500° but it is very slow at that temp.; at 600° the speed of reduction is sufficiently great to cause the total reduction of SO_2 passed at a rate of 2860 cc. per hr.; at 700° SO_2 passed over charcoal at the rate of 5550 cc. per hr. was completely reduced; at 800° and above, charcoal reduces SO_2 completely no matter at what speed the latter is passed. At lower temps. the product of the reaction is mostly CO_2, at higher temps. CO is obtained; by operating at lower temps. there is economy in charcoal. When operating with coal the reaction is hardly noticeable below 800°. At 900° SO_2 can be completely reduced by coal if the gas is passed very slowly; at 1100° SO_2 passed at the rate of 6700 cc. per hour is completely reduced even if it is passed with the greatest speed. The S_2 vapors obtained are condensed in the form of finely divided particles which can be pptd. electrically in an app. of the Cottrell type. BERNARD NELSON

Sulfur, pyrite and sulfuric acid. A. E. WELLS. *Mineral Ind.* **34,** 649-60(1925).—A statistical review of production and trade. A. B.

The specific gravity of carbonado and of gas black. W. A. ROTH, G. NAESER AND O. DÖPKE. *Ber.* **59,** 1397-9(1926).—The sp. gr. of a sample of carbonado was detd. as 3.457 at 16.85°. Its d. and heat of combustion correspond to those of a mixt. of amorphous C and diamond. The sp. gr. of gas black depends on its temp. of formation. A sample made at 1000° had a sp. gr. of 1.878 at 17°. A sample made at a 700° had a sp. gr. of 2.07 at 16°. A. W. KENNEY

Phosphate rock. WM. H. WAGGAMAN. *Mineral Ind.* **34,** 546-59(1925).—World supplies and technical developments are discussed. A. B.

Magnesite. H. M. HENTON. *Mineral Ind.* **34,** 467-72(1925).—H. discusses magnesite and Mg metal, with statistics. A. B.

Graphite. A. H. REDFIELD. *Mineral Ind.* **34,** 358-66(1925).—World production and consumption are reviewed. A. B.

Gypsum. F. A. WILDER. *Mineral Ind.* **34,** 367-71(1925).—A review of the industry, with bibliography. A. B.

Monazite. ANON. *Mineral Ind.* **34,** 498-503(1925).—Sources and production of monazite and technology of Th and Ce are discussed. A. B.

Borax. ANON. *Mineral Ind.* **34,** 103-5(1925).—Sources and production are outlined. A. B.

Bromine and iodine. ANON. *Mineral Ind.* **34,** 106-7(1925).—A discussion of production and sources. A. B.

Arsenic. H. W. AMBRUSTER. *Mineral Ind.* **34,** 62-73(1925).—A discussion of supplies and demand for As and compds. A. B.

Barium and strontium. CHARLES HARDY. *Mineral Ind.* **34,** 95-100(1925).—Occurrence, production and imports of Ba and Sr minerals and products are given. A. B.

Selenium and tellurium. S. SKOWRONSKI. *Mineral Ind.* **34,** 634-6(1925).—Technology, uses and production are discussed. A. B.

Mica. W. M. MYERS. *Mineral Ind.* **34,** 487-94(1925).—Classification and uses, markets and production are treated. A. B.

Fluorspar. H. W. DAVIS. *Mineral Ind.* **34,** 280-4(1925).—A review with statistics of production and trade. A. B.

Fuller's earth. HERMAN GUNTER. *Mineral Ind.* **34,** 285-6(1925).—Statistics of production and consumption are given. A. B.

Talc and soapstone. R. B. LADOO. *Mineral Ind.* **34,** 661-6(1925).—Trade, production, technology and uses are reviewed. A. B.

Asbestos. OLIVER BOWLES. *Mineral Ind.* **34,** 74-85(1925).—Properties and uses, production and trade in asbestos are outlined. A. B.

The testing of casein for the artificial-horn industry. FRANZ ROTH. *Caoutchouc & gutta-percha* **23,** 13,272-3(1926).—Methods are recommended for detg. the acidity, fats, ash, moisture and viscosity. *Acidity.*—Most methods are too complicated. Digest the powd. sample with 95% EtOH for 8-10 hrs., dil. with water and let stand about 16 hrs. and titrate with 0.1 *N* KOH, expressing the acidity as lactic acid. *Fats.*—The best results can be obtained by the Gottlieb method as applied to casein by Höpfner and Jandas. The *ash* and *moisture* tests involve nothing unusual. The *viscosity* can be carried out with any standard app., even in a pipet, the time of outflow of a casein soln. being compared with that of water. C. C. DAVIS

Dyeworks alkalies from waste (ELLIS) **25.** Nitric acid (KLEMENC, *et al.*) **2.** Decomposition of mixtures [H manufacture] (CICALI) **2.** Apparatus for melting and casting casein (Brit. pat. 243,514) **1.**

Hydrochloric acid. J. KERSTEN. Brit. 243,104, Sept. 8, 1924. C is added to a mixt. of alkali silicate and alkali chloride which is decompd. with steam to produce HCl. Air may be introduced with the steam to avoid external heating or internal heating by means of gaseous fuel. An app. is described.

Phosphoric acid. E. BRITZKE. Brit. 242,650, Nov. 7, 1924. In producing H_3PO_4 by the treatment of phosphorites with silicates and C in a shaft furnace, the oxidation of the elemental P present in the evolved gases is effected with air or O at a temp. of 1000-1300° so that substantially no oxidation of CO occurs. After removal of the H_3PO_4, the gas remaining can be used as generator gas. Cf. *C. A.* **20,** 2565.

Purifying phosphoric acid. A. B. GERBER. U. S. 1,601,208, Sept. 28. Impure H_3PO_4 soln. contg. 40% or more P_2O_5 is treated with sufficient H_2SO_4 to ppt. impurities as sulfates and leave an excess of H_2SO_4 sufficient to prevent the strong H_3PO_4 from dissolving the sulfates as formed.

Sulfuric acid. J. C. BOERTLEIN. Can. 263,599, Aug. 17, 1926. Gas contg. SO_2 is produced by operating an internal-combustion engine with molten elemental S as fuel, and using the heat of the exhaust gases from the engine to melt the supply of elemental S.

Hydrocyanic acid. DEUTSCHE GOLD- UND SILBER-SCHEIDEANSTALT VORM. ROESSLER AND O. LIEBKNECHT. Brit. 242,685, June 14, 1924. HCN is obtained by the reaction of gaseous C and N compds. such as CO and NH_3 in the presence of a neutral or alk. activated C at temps. of about 400-800°. The alk. activated C may be prepd. by heating a mixt. of sawdust and coal impregnated with alkali to about 800° in a stream of NH_3 and CO. After carbonization the temp. is preferably lowered to 550-600° for continued production of HCN. Hydrates, silicates, carbonates, borates, phosphates, sulfides or cyanides or other suitable compds. of alkalies or alk. earths may be used in the prepn. of the activated C. Cf. *C. A.* **19,** 1180.

Hydrocyanic acid product. O. LIEBKNECHT. Can. 263,136, Aug. 3, 1926. The product comprises an acidified activated adsorbent material charged with HCN.

Acid-proof tank. R. T. WALES. U. S. 1,601,228, Sept. 28. The bottom of a tank is formed of a layer of hard masses of material such as crushed rock or slag the interstices of which are filled with pliable or pitchy material, with slabs of other hard acid-proof material over this layer.

Ammonia synthesis. H. A HUMPHREY and SYNTHETIC AMMONIA & NITRATES, LTD. Brit. 243,122, Sept 24, 1924 A mixt. of N and H substantially free from CH_4, for NH_3 synthesis, is obtained by burning carbonaceous fuel continuously at a very high temp , *e g* , 1300°, with highly preheated steam and air or enriched air, and causing the CO thus formed to react with steam in the presence of a catalyst.

Separating salts of ammonium, alkali and alkaline earth metals. FARBWERKE VORM. MEISTER, LUCIUS & BRÜNING Brit 242,975, Nov. 17, 1924. A mixt. of coarse-grained $NaNO_3$ having a sp. gr. of about 2 3 and fine grained NH_4Cl having a sp gr. of about 1 5 is obtained by double decompn effected in a mother liquor comprising $NaNO_3$, NH_4Cl and NH_4NO_3 and having a sp gr of about 1 4. The mixt. is fed to an eleutriating app supplied with mother liquor and the heavy $NaNO_3$ seps while the light NH_4Cl flows out into a settling tank where the mother liquor is recovered from it Similar mixts contg Na_2SO_4 (when NH_4Cl is obtained from $(NH_4)_2SO_4$) or other like compds may be sepd by elutriation.

Nitride and ammonia manufacture. C. URFER Can. 263,820, Aug. 24, 1926. NH_3 is manufactured by causing a mixt of heated N_2 and H_2 to react with at least 1 metal of the Fe group, at least 1 chem. compd of Li contg. N_2 and at least 1 oxide of the Al family

Granular alkali. R E WILEY and C E. MENSING U. S. 1,601,898, Oct. 5. Regularly formed dry globular granules of material such as NaOH or KOH in union with an inert inorg powder such as powd talc are obtained by action of an air blast to which the alkali is fed in fused condition

Apparatus for spraying fused caustic soda into an air blast to produce granular material. R E WILEY and C E. MENSING. U. S 1,601,897, Oct. 5.

Alkaline sulfide solution. R. A. MORGAN, I. ROSENSTEIN and W. S YARD. Can. 263,221, Aug. 3, 1926 H_2S is removed from gas by treating the gas with an alk soln. contg NiS, then treating the fouled liquid with an oxidizing agent, whereby the NiS catalyzes the oxidation of the dissolved H_2S with sepn of free S, and then returning the regenerated liquid to the gas-treating state

Purifying alkali metal xanthate solutions. W. HIRSCHKIND. U. S. 1,601,068, Sept 28 An inorg. acid such as H_2SO_4 or HCl is added in proportionate quantity to react with all the carbonates, thiocarbonates, sulfides and other impurities present

Sodium bicarbonate. GES. FÜR KOHLENTECHNIK Brit. 243,677, Nov. 26, 1924. In a modification of the ammonia soda process described in Brit. pat No. 229,640 (C. A 19, 3149), NaCNS or NH_4CNS is used as the readily sol salt

Barium and strontium compounds. F. ROTHE and H. BRENEK. Brit. 242,996, Nov 12, 1924 $BaSO_4$ or $SrSO_4$ is decompd by heating with SiO_2 or a material high in SiO_2 such as Ba or Sr metasilicate (which may be obtained as a by-product in the process) to produce Ba or Sr silicates of a compn. between Ba_2SiO_4 and Ba_3SiO_5 or Sr_2SiO_4 and Sr_3SiO_5 These silicates may be treated with an acid such as HCl or HNO_3 to obtain the corresponding salts and SiO_2, or may be treated with H_2O which converts part of the material into Ba or Sr hydroxide, leaving a residue of metasilicate

Calcium nitrate. FARBWERKE VORM. MEISTER, LUCIUS & BRÜNING. Brit 242,990, Nov. 11, 1924 $Ca(NO_3)_2$ which does not readily become moist is obtained by adding a small proportion of $Ca(NO_3)_2$ crystals to a quantity of practically anhyd $Ca(NO_3)_2$ at a temp below the m p of the crystals.

Aluminum fluoride. E TEISLER. Can. 263,352, Aug 10, 1926. Fluoride of Al poor in silicic acid is manufactured by causing finely disintegrated uncalcined clay or other aluminous minerals contg besides alumina also silicic acid and aq. HF to interact and introducing into the soln a substance which contains alumina in the form of an oxide or a hydrate, and which is adapted to decomp the primarily arising fluosilicate of Al and to sep silicic acid.

Aluminum sulfate. R M. MEIKLEJOHN. Can. 263,596, Aug. 17, 1926. Alumina-bearing material and H_2SO_4 are caused to react under conditions where the ratio of H_2SO_4 contained in the mix to the total water present is greater than 1:1.3, and in which the reaction is so conducted that the material is continuously maintained above 160°.

Sulfite. L. BRADLEY and E. P. MCKEEFE. Can. 268,180, Aug. 3, 1926. Na_2SO_3 and $MgSO_3$ are produced by subjecting dolomitic limestone or lime to the action of SO_2, and subjecting the admixed sulfites to the action of Na_2SO_4 and $MgSO_4$ in the

presence of an acid with the resulting formation of $CaSO_4$ as a ppt. and a soln. contg. Na_2SO_3 and $MgSO_3$.

Sodium sulfide. F. MEYER. Can. 264,150, Sept. 7, 1926. Na_2S is made in uniform predetd. shapes by forming individual drops of the molten Na_2S, causing them to fall vertically and freely to come into contact with hard surfaces of lower temp. than the m. p. of the Na_2S.

Calcium superphosphate. A. C. HYDE. Brit. 243,192, Jan 19, 1925. Finely ground Ca phosphate in the form of a dust cloud is mixed with a fine spray of H_2SO_4 which may be of 1.84 sp. gr or of somewhat less strength.

Diammonium phosphate. H. BLUMENBERG, JR. U S. 1,601,233, Sept. 28. Finely ground crude Ca phosphate is treated with an aq soln of NH_3 in the presence of SO_2.

Treating potassiferous silicates. W. R. ORMANDY and A. M PEAKE. Brit. 212,336, Aug 2, 1921 Leucite or similar minerals are treated with phosphates of the alk. earth metals, $CaCO_3$ and H_2SO_4, in the presence of H_2O, to recover the K values in the raw material and also to produce a *fertilizer*. Either dil H_2SO_4 or niter cake may be used and phosphate rock carrying $CaCO_3$ may be employed as a raw material, with or without addn of peat or other absorbent org material

Nitrogen trichloride. J. C. BAKER. Can 263,831, Aug 24, 1926. NCl_3 is produced in gaseous form by bringing in reactive relation in a soln Cl_2 and an NH_4 compd , allowing such soln to stand until the reaction is complete, and then removing from the soln the NCl_3 by a current of air

Compartment tank for purification of zinc solutions. T. P. CAMPBELL. U. S. 1,601,938, Oct. 5.

Alumina. E. L. RINMAN. Brit. 243,356, Nov. 22, 1924. In order to obtain pure Al_2O_3 from siliceous materials such as clay, $Al_2(SO_4)_3$ is first formed and is treated with alkali sulfhydrate to ppt. crude alumina contg ferrous sulfide and liberate H_2S, the alumina is dissolved in alkali sulfide to obtain alkali aluminate and a residue contg. ferrous sulfide, and pure alumina is pptd. from the aluminate by H_2S thus reforming alkali sulfhydrate.

Alumina. R. JACOBSSON. Brit. 243,183, Dec. 16, 1924. In the production of Al_2O_3 by the process described in Brit pat No 221,209 (*C. A* **19**, 877), the aluminous raw material is treated with a weaker H_2SO_4 (which may be of a d. of 1 30) and the soln. of $Al_2(SO_4)_3$ produced is evapd. until on cooling all the H_2O is bound as H_2O of crystn After calcining the sulfate to produce Al_2O_3, the latter is purified from Fe by reducing the Fe_2O_3 and treating with gaseous HCl free from H_2O and O in the presence of $AlCl_3$ or with Cl or HCl free from H_2O and O in the presence of C, Cr or Sn or of CCl_4 or chloride of Cr or of Sn or like materials.

Mining sulfur. B. ANDREWS. U. S. 1,602,475, Oct. 12. In mining S overlying a stratum of rock-salt, a flow of H_2O below the m p. of S is passed through a drill hole into the salt below the S stratum to form a cavity in the salt stratum, and hot H_2O is then passed into the cavity to melt the S, cover the bottom of the cavity with S and laterally extend the cavity. S is brought to the surface in molten form by the action of air and pumps

Sulfur and polysulfides. R. RUSSELL. Brit. 243,394, May 23, 1924. Alkali polysulfides contg. S in colloidal form are obtained by mixing with H_2O S or S-contg material together with a compd. of B and of Na or K, heating to 100–200° and straining the liquid product. The liquid may contain up to 50% of S and may be emulsified with rubber soln. or with latex or used for medical or veterinary purposes. S-bearing ore, oil-bearing shale contg. S and S-contg. oils may be treated with Na or K compds. together with B compds to dissolve S from them.

Zinc oxide. J. F. CREGAN. Can. 263,935, Aug. 31, 1926. Zn ores are smelted in a reverberatory furnace to produce a Zn fume, the fume at high temp. is conducted to a sep. chamber, a reducing gas is mixed with it and the metallic fume is oxidized.

Ferric oxide recovery. D. G. ZALOCOSTAS. Can. 263,852, Aug. 31, 1926. $FeSO_4.7H_2O$ crystals are heated under conditions immediately to vaporize the liberated water of crystn and inhibit cementing, grinding the dehydrated product thus obtained, then oxidizing it and finally roasting it.

Activated carbon. J. N. A. SAUER. Brit. 242,659, Nov. 8, 1924. Gases used for activating C obtained from various raw carbonaceous materials are supplied to the material, either alone or mixed with heating gases, transversely to the axis of the retort used and are then caused to pass in a direction parallel with the axis of the retort in the same direction with or countercurrent to the carbonaceous material. Details of retort construction are specified. Cf. *C. A.* **20**, 3543.

Reactivating carbon, gels or other adsorption media. METALLBANK UND METAL-

LURGISCHE GES. AKT. GES. Brit. 242,986, Nov. 12, 1924 The substances set free by heating in a reactivating app. are discharged (*e g*, by the action of inert scavenging gases) before coming into contact with adjacent layers of cooler material in the regenerating app. Various structural features are described. Cf. *C. A.* **20,** 2232.

Bonded absorptive carbon. A. B. RAY. Can 263,964, Aug. 31, 1926. Absorptive charcoal is bonded by assocg. the charcoal with a soln. of a sugar and thermally decompg. the sugar to give a carbonaceous bonding residue.

Bleaching powder. A. LAMBLE and UNITED ALKALI CO., LTD. Brit. 242,805, Dec. 15, 1924. Bleaching powder is rendered stable by first partially or wholly drying it and then adding a small proportion of CaO.

Arsenic compounds. E. R. RUSHTON. Can 263,912, Aug 31, 1926. In reactions for the manuf. of As compds. As_2O_3 is applied in gaseous form in the presence of O.

Oxidizing catalyst. J. C. W. FRAZER. U. S. 1,602,404, Oct. 12. A highly active oxidizing catalyst adapted for use in oxidizing CO, NH_3, SO_2, aldehydes, alcs. or toluene consists of finely divided porous MnO_2 formed by treating a Mn compd. such as $KMnO_4$ and $MnSO_4$ with HNO_3 while cold.

Chemical-heat bag. A. RITZ. U. S. 1,602,456, Oct 12. A material for slowly generating a "mild prolonged heat" when moistened with H_2O comprises Fe particles and substances such as $CaCl_2$, S and NaCl which accelerate the chem. action on the Fe and which do not form any gaseous products by the chem. action. The Fe may be preliminarily treated with HCl

Siliceous adsorptive materials. F X GOVERS. Brit. 243,123, Sept. 25, 1924. After pptn. of a colloidal silicic acid sol and before a gel can form, H_2O is removed from the sol by spraying it into a heated chamber. The drying is carried out to such an extent that the settled solids will not form a sol or gel on contact with H_2O. The product is washed free from impurities with H_2O and again dried. Fe, Ag, Pt or other catalysts may be added at the time of pptn.

Imitation mother-of-pearl. E. F. HIGGINS. Brit 243,558, Jan. 14, 1925. Pyroxylin and fish-scale or similar substances are formed into superposed layers. Cf. *C. A.* **19,** 2264.

Catalyst. W. SCHULTZE. Can. 263,772, Aug 24, 1926. The catalyst contains material suitable for the treatment of gases contg CO, in the step wherein CO in the presence of steam is oxidized to CO_2 and is substituted by H_2. The material is of an Fe character and compressed in dry condition to a compact coherent body previous to the catalysis gases. Cf. *C A* **19,** 710

Plastic composition. A. R. KEMP. Can 263,654, Aug. 17, 1926. A filler of fused silica in a finely divided amorphous state which has the surfaces of individual particles in a cryst. state.

Molded phenolic condensation products. G L PEAKES. U. S. 1,602,249, Oct. 5. Molded phenolic condensation products are subjected to a heat-treatment to improve their insulating properties, at a temp below the normal molding temp., *e. g.*, by subjection to a temp of about 125–135° for 70–80 hrs.

Adhesive. P. S. OTTO. U. S 1,602,200, Oct 5. A nonhardening adhesive adapted for use on paper is formed from C_6H_6 76, ether 2, an NH_3 soln. 0.5, acetone 0.5 and unvulcanized rubber 21 parts.

Agglomerating sawdust or other absorbent materials. J PETITPAS. Brit. 242,665, Nov. 10, 1924 Sawdust, wood shavings, hemp waste, paper or other like materials for making compressed products are mixed with a binder such as tar incorporated with a gelatinous compn. which may be formed from albuminoid, cellulosic or amylaceous substances, gums or mucilages, with or without addn. of metal powder, abrasives, coloring, waterproofing or other substances.

Shaft furnace for drying fuller's earth. G G BROCKWAY. U. S. 1,602,842, Oct. 12.

Foam-stabilizing composition. G. J. ESSELEN, JR. Can. 263,776, Aug. 24, 1926. A foam-stabilizing compn. consists of evapd. neutralized sulfite waste liquor, and an alkali metal resinate.

Antifreeze solution. H. SCHLOSSTEIN. U. S. 1,601,328, Sept. 28. The Na salt of hydroxypropionic acid is used in viscous concd. soln. as an "antifreeze" for automobile radiators.

Articulating fluid. M. SEGAL. U. S. 1,601,650, Sept. 28. A surface contact testing compn. adapted for use as a contact indicator in fitting dental crowns or in similar operations comprises glycerol 10 cc., H_2O 5 cc, and lampblack 2 g.

Composition for permanently sealing root canals of teeth. J. R. DUNCAN and E. L. LANGDON. U. S. 1,601,301, Sept. 28. A dry mixt. of ammoniated alum 48, aristol

4, MgO 96, thymol 36, and ZnO 168 parts is formed into a paste with a suitable antiseptic soln. such as cresol or CH_2O soln.

Hot-box compound. W. J. HEATON. U. S. 1,603,077, Oct. 12. "Signal oil" is mixed with about twice its quantity of a mixt. formed from elain oil 16.5, lard oil 3 5, mineral oil 39.02, "potash" 3.10 and H_2O 37.88%.

Razor-strop dressing. J. KAZDA. U. S. 1,602,437, Oct. 12. A mixt. of carborundum 5, paraffin 75, beeswax 10 and graphite 10 parts.

Sectional retort for bone black or fuller's earth kilns. R. S. KENT. U. S. 1,602,678, Oct. 12.

Stencil sheet. D. A. WILLIAMS and J. W. ROWE. Can. 264,211, Sept. 7, 1926. A cellulose ester is dissolved in acetone and another solvent, glycerol and resin are added, and the mixt. is digested to form an impregnating substance.

19—GLASS, CLAY PRODUCTS, REFRACTORIES AND ENAMELED METALS

G. E. BARTON, C. H. KERR

Glasses as supercooled liquids. G. TAMMANN *J. Soc. Glass Tech.* 9, 166–85 (1925).—The factors controlling the glassy state are the no. of crystn. centers formed, rate of crystal growth and viscosity of liquids. Devitrification takes place most rapidly at temps. 30–100° below the m. p. of the substance. A high supercooling capacity is seldom evident with chem. homogeneous substances. H. F. K.

The nature and constitution of glass. W. E. S. TURNER. *J. Soc. Glass Tech.* 9, 147 66(1925) —Silicate glass, a rigid soln., may be considered a mass of SiO_2 threads soaked in the silicates or their dissocn. products The existence of certain compds. as $Na_2O.2SiO_2$ has been shown in glass and other solns. while others as $6SiO_2.CaO.Na_2O$ have been indicated. It is probable that the mol wt. of fluid glass at temps. 1200–1450° is high. H. F. K.

Composition of modern glass mixtures. I. Color glasses. (a) Ruby glasses. OSKAR LECHER *Continental Met Chem. Eng.* 1, 11–2(1926).—Several formulas of ruby glasses are given and the importance of pure acid in the prepn. of the Au and the Sn salts is pointed out A mixt rich in Au and Sn, deep in color and used for flashing coat and for coloring opal glasses contains: 100 kg. sand, 120 kg Pb_3O_4, 30 kg KOH, 8 kg. KNO_3, 4 kg. borax, 100 g. Au and 2 kg. Sn dissolved in acid and 1.2 kg K tartrate. Tints are changed by varying the amount of Au salt, adding pyrolusite, by combination with opal glasses, and with Se-ruby with or without CdS. Au-ruby glass is better suited for flashed glasses and glass-blowing purposes than Cu-ruby glasses. W. H. BOYNTON

The thermal expansion of glasses at high temperatures, the formation of strains and the cooling process. H. SCHÖNBORN. *Keram. Rundschau* 33, 17(1925): *J. Soc. Glass Tech* 9, 10–2.—The differential method of measuring the expansion over the whole range of a temp. up to the softening point of the glass was used. Rods 10 cm. long of quartz, constantan and the glass under investigation were placed in 3 borings in an elec heated metal cylinder. The borings were parallel to the axis and formed a right triangle with the quartz at the 90° angle. The rods were fixed at one end and free to move at the other, to which was attached a mirror. A reflected spot of light traced the expansion curve on a photographic plate Typical curves are given for Thuringian, lead, boro-silicate, lead oxide-alumina-borate and tungsten glasses. "Temporary" and "permanent" strains are discussed. In the former case the range below the annealing temp is most important, in the case of the latter the temp. range above the critical zone (where the expansion begins to increase rapidly) was decisive. Various cooling processes for annealing glass are discussed M. O. LAMAR

The annealing and re-annealing of glass. W. M. HAMPTON. *Trans. Opt. Soc.* (London) 27, No. 3, 161–80(1925–6).—The formulas deduced in previous papers (cf *C. A.* 19, 2114) are applied to the heating of glass under a const. gradient and the temp. at which strain disappears is obtained. The effect of the known change in coeff. of expansion on this temp. is discussed. A comparison is given between calcd. and exptl. curves, and a discussion of the effect of change in the rate of heating and in the size of the specimen. The annealing equation is discussed from the dimensional point of view. Agreement of theory and expt. is considered and an explanation advanced for discrepancies at low temps. A general expression to cover all cases is deduced. D. E. SHARP

New ultra-violet transmitting glass. H. P. Hood. *Science* **64**, 281–2(1926).—A new glass (980 A) has been developed at the Corning Glass Works, which transmits rays of 200$\mu\mu$ in 3 mm. thickness. This glass has a d. 2.64, n_D 1.539, a dispersion for $N_p - N_c$ of 0.009 and possesses a stability within the range of ordinary glasses. The cost of production is above that of window glass but far below that of quartz.
L. W. Riggs

The inside frosting of incandescent lamps. Marvin Pipkin. *Ind. Eng. Chem.* **18**, 774–6(1926).—Incandescent lamps of satisfactory strength are made from inside-frosted bulbs by subsequently treating them with a soln. that will dissolve glass. This soln. may or may not be the same as the frosting mixt., though for smooth finish the acidity must be lower than for the frosting operation. Means of conducting strength tests, a comparison of exterior and interior frosting and some frosting and strengthening mixts. are given.
W. H. Boynton

Some observations of surface deposits formed in glass-furnace regenerators. H. Insley. *J. Am. Ceram. Soc.* **9**, 635–8(1926).—Deposits found on the surface of 2 highly aluminous bricks were mostly nephelite, carnegieite and corundum. The first 2 can form only at temps. lower than glass-melting temp. but corundum may be formed at melting temp.
C. H. Kerr

Glass wool as insulator for refrigeration purposes. H. C. Bates. *J. Am. Ceram. Soc.* **9**, 690–2(1926).
C. H. Kerr

Wearing away of tank blocks. D. W. Ross. *J. Am. Ceram. Soc.* **9**, 641–53 (1926); cf. *C. A.* **20**, 2398.—Wearing away is largely by soln. of downward-facing surfaces and is largely eliminated by eliminating horizontal joints. The deeper any horizontal joint is below the metal line, the less is the wearing away. Excessively reducing atm. accelerates soln. at the glass line, especially with excess of salt cake. Used tank blocks show that thimble like gas blebs are frequently, if not always, present in the cavities of downward-facing surfaces.
C. H. Kerr

The mullite content of some American tank blocks. F. S. Thompson and H. I. Vormelker. *J. Am. Ceram. Soc.* **9**, 639–40(1926).—Method of analysis: a 1-g. sample was added to 20 cc. HF and let to stand for 12 hrs. at 20°. The residue was weighed and analyzed. The % residue (mullite) from various tank block mixts. varied from 2.82 to 12.78. Refiring the original samples for 24 hrs. at 1450° increased the residue (mullite) from the above figures to 15.2–22.01%. Results are approx. and not conclusive.
C. H. Kerr

Future progress in ceramic chemistry. Geo. W. Morey. *Ind. Eng. Chem.* **18**, 1023–5(1926).
E. J. C.

Zircon as a constituent of ceramic bodies. W. L. Shearer. *Ceramist* **5**, 316; *J. Soc. Glass Tech.* **9**, 153–4.—The phys. and chem. properties of zircon, baddeleyite and quartz are tabulated for comparison. In S.'s expts. the zircon used was from beach sand deposits at Pablo Beach, Fla. Test pieces contg. 30, 60 and 70% zircon were made and fired to cone 12, and their phys. properties tabulated. In general, the use of feldspar in a zircon body was detrimental to its resistance to thermal shock. The high density of zircon did not preclude its use in casting mixts.
M. O. Lamar

Modeled treatment of pottery. M. L. Fosdick. *J. Am. Ceram. Soc.* **9**, 697–700 (1926).
C. H. Kerr

The spalling of bricks. F. W. Preston. *J. Am. Ceram. Soc.* **9**, 654–8(1926).—The surface of sepn. bears no simple relation to the isothermal surfaces. In a "semi-infinite" slab, the diffusivity has no influence on the tendency to spall, but does influence the location of the surface of parting.
C. H. Kerr

A study of the shrinkage of diaspore clays. I. S. M. Phelps. *J. Am. Ceram. Soc.* **9**, 659–66(1926).—Shrinkage is inversely in the order of Al_2O_3 content. Shrinkage is influenced greatly by the duration of the firing period and the state of subdivision. The bond or plastic portion and the grains of diaspore differ widely in firing properties. Heat treatment of diaspore should be ample to produce the shrinkage that would occur in service.
C. H. Kerr

Choosing and testing firebrick. H. E. Weightman. *Power* **64**, 549–51(1926).—The importance of intelligently limiting the specifications is urged. Refractories should not be called upon unduly for load-bearing.
D. B. D.

What is good firebrick? H. E. Weightman. *Power* **64**, 508–10(1926).—The selection and testing of refractories are discussed.
D. B. Dill

Specifications for lining and checker brick for water-gas manufacture. E. J. Brady. *J. Am. Ceram. Soc.* **9**, 667–78(1926).—Specifications are suggested, based on the experience of United Gas Improvement Co.
C. H. Kerr

Redesigned driers. H. M. KRANER AND A. H. FESSLER. *J. Am. Ceram. Soc.* **9,** 679–83(1926).—For dry-press porcelain. C. H. KERR

A successful application of powdered coal as a tunnel kiln fuel firing hard-fired common brick. F. M. HARTFORD. *J. Am. Ceram. Soc.* **9,** 684–9(1926). C. H. K.

Feldspar. A. S. WATTS. *Mineral Ind.* **34,** 277–9(1925).—Sources, production, and grinding are discussed. A. B.

The melting point of enamels. A. OTREMBA. *Keram. Rundschau* **33,** 201; *J. Soc. Glass Tech.* **9,** 96–8.—This is an account of the relative effects of fluorspar, cryolite, and sodium fluosilicate on the m. p. of an enamel composed of: quartz 19.1, B_2O_3 4.32, borax 34.4, feldspar 34.6, Al_2O_3 3.19, and fluorspar 3.5%. The fluorspar was increased progressively to 72% at the expense of the other ingredients. Also the quartz and feldspar contents were varied over a wide range. O. concludes that fluorspar acts sometimes as a flux, again as a refractory material. Similar expts. were carried out with cryolite and sodium fluosilicate. No mention is made as to what method was used for detg. the m. p. M. O. LAMAR

Gas produces better results at less cost [in sheet iron enamel furnaces]. G. D. WILKINSON. *J. Am. Ceram. Soc.* **9,** 693–6(1926). C. H. KERR

The life of refractories in the glass industry. K. ENDELL. *Sprechsaal* **51,** 321; *J. Soc. Glass Tech.* **8,** 289–93.—Comparative data are given for the properties of German, Dutch and American tank blocks, including type of clay, chem. analysis, porosity, softening point and deformation temp. Extensive tables record similar properties for 11 different SiO_2 bricks and 20 aluminiferous bricks. M. O. LAMAR

Foundry refractories. M. C. BOOZE. *Fuels Furnaces* **4,** 1071–6(1926).—The selection of refractories for foundry furnaces and the conditions imposed upon them in practice are discussed. H. F. K.

Physical chemical investigations of "Borowitsch" refractory clays. G. G. URZSOV. *Z. anorg. allgem. Chem.* **154,** 152–69(1926).—Different types of "Borowitsch" clay exhibiting great variations in ceramic properties, are discussed in light of heating and dehydration curves. PER K. FRÖLICH

The ternary system Na_2SiO_3–$CaSiO_3$–SiO_2 (MOREY, BOWEN) **2.** Plasticity (DE WAELE) **2.** Refractories for generator linings (BAUMGARTNER) **21.**

Glass. JENAER GLASWERK SCHOTT & GEN., O. SCHOTT and H. THIENE. Brit. 24[illegible], Aug. 4, 1925. A glass insensitive to abrupt temp. changes contains at least SiO_2 45, B_2O_3 2–15, MgO and CaO (or BaO or ZnO) together 4–30, Al_2O_3 20–30% and not more than 8% of alkali oxide. Oxides of Pb or Sb up to 6% also may be used.

Glass. E. THOMSON. U. S. 1,603,221, Oct. 12. Glass-making material is fed downwardly into a reaction zone where it is heated to fusion while the upper zone of the material is protected with unfused material, and the material is cast downwardly when a clear glassy product has been formed.

Tank furnace for glass manufacture. J. BOUCHER and A. BOUCHER. Brit. 243,-322, Nov. 22, 1924.

Apparatus for feeding molten glass from furnaces. C. H. RANKIN. Brit. 243,459, Sept. 3, 1924.

Boiler-gage glasses. W. C. FOX. Brit. 243,105, Sept. 9, 1924. The interior of the glass is etched or sand-blasted to render the liquid level in the glass more clearly visible.

Sheet glass with figured designs. E. DANNER. Brit. 243,638, June 30, 1925. Mech. features.

Apparatus for continuous drawing of glass sheets. SOC. ANON. ATELIERS J. HANREZ. Brit. 242,574, July 28, 1925.

Apparatus for drawing tubes and the like of silica glass. H. GEORGE. U. S. 1,601,523, Sept. 28.

Flux (containing boron phosphate) for enamel, glass and ceramic materials. H. BLUMENBERG, JR. U. S. 1,601,231, Sept. 28. U. S. 1,601,232 specifies a flux containing an alkali metal boron phosphate. The B compds. lower the temp. required for fusion.

Marking spectacle lenses. E. D. TILLYER. Brit. 242,576, Sept. 8, 1925. H_3PO_4 is used for markings on glass which become visible by slight moistening such as by breathing on the glass and which disappear when the glass becomes dry.

Joining glass to metals. ALLGEMEINE ELEKTRICITÄTS-GES. Brit. 243,553, Jan. 2, 1925. After fusing together glass and a metal, the 2 materials are brought to different temps. such that on cooling the effects of their different coeffs. of expansion are compensated.

Purifying clay. W. FELDENHEIMER. Brit. 242,357, Aug. 7, 1924. Clay is simultaneously treated with 2 or more reducing agents such as Na sulfide, oxalate sulfite, bisulfite, metabisulfite, hyposulfite, or thiosulfate, Ca sulfide dissolved in alkali carbonate soln., K sulfide, SO_2 and oxalic acid. The treatment may effect purification by deflocculation, with or without addn. of other deflocculators such as Na pyrophosphate or oxalic acid. Brit. 242,358 specifies improving the color of clays by treatment in aq. suspension, with an acid sulfite such as $NaHSO_3$ or metabisulfite and a metal such as Zn which reduces H_2SO_3 but does not form colored salts. A trace of HCl or other inorg. acid may be added.

Clay for tiles or pottery. H. SPURRIER. Brit. 242,916, July 1, 1925. See U. S. 1,559,652 (*C. A.* 20, 100).

"Modeling clay." E. E. SNOOK. U. S. reissue 16,435, Oct. 5. See original pat. No. 1,568,098 (*C. A.* 20, 650).

Downdraft kiln for burning clay products. P. J. LENGSHOLZ. U. S. 1,601,028, Sept. 28.

Decorating pottery. LOVATT & LOVATT, LTD., AND A. E. LOVATT. Brit. 242,898, May 27, 1925. Earthenware articles are dipped in glaze and allowed to dry, then decorated with a mixt. of a pigment and a "matt" medium (*e. g.*, a metal oxide mixed with quartz, lime, clay and liquid gum) by a transfer process and the glaze and decoration are fired together in a single operation, thus producing a decoration with a matt finish on a glazed ground.

Earthenware formed from pulverized material. H. R. STRAIGHT. U. S. 1,602,720, Oct. 12. In forming earthenware from pulverized material to be burned such as shale, the material is first pulverized to a granular state and then subjected to the action of superheated steam to raise its temp. nearly to or above the b. p. of H_2O. H_2O is then introduced and the material is pugged, molded while hot, and dried.

Continuous tunnel kiln of the muffle type. L. A. VINCENT. U. S. 1,601,748, Oct. 5.

Tunnel kiln for burning ceramic wares. H. R. STRAIGHT. U. S. 1,602,721, Oct. 12.

Oil-burning kiln and tunnel for burning brick. R. W. WIEDERWAX. U. S. 1,602,-293, Oct. 5.

Refractory products from zirconiferous ores. F. C. F. LE COULTRE. U. S. 1,602,-273, Oct. 5. Zr-bearing ore is heated to a high temp. in an elec. furnace with a circular enclosure and then discharged from the furnace into a violent stream of H_2O contg. 0.1% H_2SO_4.

Enameling or glazing metal articles. W. LAMBERT, A. A. MEAD and J. STONE & CO., LTD. Brit. 243,033, May 20, 1924. In hot enameling metal tubes or other metal articles, while they retain sufficient heat from a previous treatment to effect complete vitrefication of the enamel, a reducing or neutral agent is delivered to the metal simultaneously with the coating material to prevent oxide formation and to reduce oxide already present.

Furnace and oven for fusing enamel ware, etc. H. C. BEASLEY and R. MACDOUGALL. U. S. 1,603,015, Oct. 12.

Furnace for enameling metal ware. H. C. BEASLEY and R. MACDOUGALL. U. S. 1,603,014, Oct. 12.

20—CEMENT AND OTHER BUILDING MATERIALS

J. C. WITT

Cement. R. W. LESLEY. *Mineral Ind.* **34,** 111–23(1925).—A review of the industry in the U. S. and foreign countries. A. B.

The development of hydraulic cementing materials. G. HAEGERMANN. *Zement* **14,** 143–7(1925).—Historical discussion, giving the specifications and properties of the normal and special cements. H. F. K.

Modern portland cement manufacture. S. DICKSON. *J. Soc. Chem. Ind.* **45,** 310–2T(1926).—The importance of fine grinding of raw mix and clinker is stressed and an elutriation app. is described. RAYMOND WILSON

Testing of portland cement. R. H. HARRY STANGER. *J. Soc. Chem. Ind.* **45,** 312–5T(1926).—Descriptive. RAYMOND WILSON

Raw batch and clinker analyses. O. FREY. *Zement* **14,** 141–3(1925).—The influence of the ash upon the compn. of the clinker is irregular though in general the greater the difference between the content of SiO_2 and of R_2O_3, the greater is the effect of the ash. H. F. K.

Setting time of cement indicated by a machine operation. A. A. JAKKULA. *Eng. News-Rec.* **97,** 66(1926).—An app. is described and illustrated which automatically indicates the time of set of cement. R. E. THOMPSON

The initial set and time of hardening of different cements at low temperatures with and without calcium chloride. OTTO GRAF. *Zement* **14,** 213–4(1925).—An aluminous cement set as quickly at 1° as at 18° while the time required for setting by a special portland cement, a normal portland cement, and a blast-furnace cement increased 3-, 7-, and 5-fold, resp. With $CaCl_2$ hardening was hastened in all cases, though not to the same extent with the various cements. H. F. K.

The application of Röntgen rays to cement research. R. NACKEN. *Zement* **14,** 419 22, 437–9(1925).—The general methods of Röntgen-ray analysis are described but no new data are presented. H. F. K.

Cement specifications changed by Missouri Highway Commission. F. V. REAGEL. *Eng. News-Rec.* **96,** 657(1926).—To meet conditions in Missouri, two changes were made in cement specifications for 1926, namely: (1) a min. tensile strength of 225 lbs. at 7 days was specified, and (2) a provision was added to the effect that fluctuations in setting time causing finishing difficulties in field would be held cause for rejection. R. E. T.

A device for measuring pressures used in molding cement mortar briquets. F. H. JACKSON AND D. O. WOOLF. *Public Roads* **7,** 104–6(1926).—Diagram. A. E. G.

The compound $8CaO.2SiO_2.Al_2O_3$. WALTER DYCKERHOFF. *Zement* **14,** 102–4, 120–2(1925).—This compd. reported by Jänecke in 1911 (*C. A.* **6,** 673) was not confirmed by Rankin and Wright in 1912 (*C. A.* **6,** 1829). A mixt. composed of $2SiO_2.Al_2O_3$, and 8CaO heated to its m. p. yields a homogeneous substance melting incongruently at about 1900°. Its properties are: sp. gr. 3.090, n_D^{20} alpha 1.703 ±0.002, gamma 1.707 ±0.002, monoclinic, optically neg., biaxial with large optic angle and with the plane of the angle normal to the elongation. H. F. K.

Procedure for analysis of mortars. J. L. HEITZMAN. *Eng. News-Rec.* **97,** 271 (1926).—Weigh 1 g. of crushed and dried sample, add 50 cc. dil. HCl (1–9) and boil until all sol. material is in soln. Filter, ignite and weigh. This wt. × 100/95 = sand content. Evap. the filtrate to dryness, cool, add 20 cc. dil. HCl (1:1), warm until Fe salts are in soln. and then add 50 cc. distd. water. After boiling, filter, ignite and weigh. This wt. × 500 = approx. percentage of portland cement. Dirty sand would introduce an error in this calcn. Det. CaO and MgO in the filtrate in the usual manner. Calc. the CaO and MgO in the cement by multiplying the latter by 0.625 and 0.032 resp., and subtract these amts. from the total CaO and MgO found. The combined remaining CaO and MgO × 100/95 = approx. percentage of lime. R. E. THOMPSON

Tests of vibrolithic concrete. L. W. TELLER. *Eng. News-Rec.* **96,** 779(1926).—The vibrolithic process was found to give a more uniform product, which exhibited greater strength at 28 days for a given cement content than normal concrete. R. E. T.

Comparison of transverse and compressive tests of concrete. H. F. CLEMMER. *Public Roads* **7,** 67–8(1926).—Tests of compressive strengths on concrete show variations as high as 138% on samples from the same specimen of concrete. That no such difference in the actual strength of the concrete exists is shown by the transverse tests, which check within 5% in 12 out of 14 cases. A. E. GRAY

Tests of concrete in tension. A. N. JOHNSON. *Public Roads* **7,** 90–2(1926).—The ratio of tensile strength to compressive strength of concrete is fairly constant, 6–10%. A diagram of the app. for tension tests is shown. A. E. GRAY

Bitumen determinations in coarse asphaltic concretes. A. R. EBBERTS. *Eng. News-Rec.* **97,** 513–4(1926).—A method is described for detg. whether the bitumen content of asphaltic concretes conform to specifications. By dividing the amt. of bitumen specified by the total superficial area of the ideal grading as detd. by the specifications, a value termed the bitumen index is obtained. Comparison of the bitumen content found on extn. with value obtained by multiplying the superficial area of the aggregate after extn. by the bitumen index, detd. as above, shows whether the specimen is of the desired compn. A chart is given for detg. the superficial area of the aggregate from the sieve analysis. R. E. THOMPSON

Strengthening and indurating concrete with sulfur. W. H. KOBBE. *Eng. News-Rec.* **96,** 940–2(1926).—The strength of concrete can be considerably increased by impregnating with S. The treatment process consists of immersing the concrete in a bath of S maintained at 130–150° for several hours. Standard tensile briquets of cement mortar which ordinarily break at 150 lbs. are increased in strength to over 1000 lbs. and as high as 2000 lbs. per sq. in., by this treatment, and strength under compression is similarly increased. Water absorption is usually reduced to less than 2–3%. R. E. T.

Concrete strength made uniform by careful proportioning. ZARA WITKIN. *Eng.*

News-Rec. **97,** 258–9(1926).—Data are given on the quality of concrete produced during construction of a building on which 3 field methods were employed, (1) volumetric measurement of aggregates, (2) wt measurement of fine aggregate, and (3) inundation of fine aggregate. The following conclusions are drawn from the observations made: (1) Accurate control of the water content of the aggregates, with the same theoretical mix, effected a reduction of 6 7% in the amt. of cement required. (2) With accurate water content control and const mix, the strength is an inverse function of slump. (3) With accurate water content control the strength with the same theoretical mix is slightly higher and considerably more uniform R. E. THOMPSON

The permeability of portland cement concrete. W. H. GLANVILLE. Dept. Sci. Ind Research, *Building Research Tech Paper* No. **3,** 50 pp (1926).—Results of tests are summarized under the following heads: (1) Constituent materials. Minimum permeability is obtained with the quantity of water giving minimum volume of concrete (minimum voids). Too little mixing water causes a greater increase in permeability than too much water. The influence of water content decreases with age It is greater for lean mixes than for rich ones Cement and water content are of approx equal importance. Increasing the cement above that in a 1·2 4 mix does not materially affect the minimum permeability. Decrease in permeability is more rapid in rich mixes than in lean mixes. Proportioning of aggregates is less important than the cement and water content. The sand content is more important than the gravel content, the presence of sufficient fine materials being necessary for low permeability Inert powdered admixtures decrease the permeability of lean concrete. (2) Methods and processes of prepn. Prolonged ramming reduces permeability of the drier mixes, but does not appreciably affect minimum void mixes Trowelling reduces the permeability of dry mixes, but has little effect on wet mixes Specimens cast on edge are more permeable than those cast flat. Wire brushing the surface increases the permeability. (3) Subsequent treatment The permeability of water-cured concrete decreases with age, becoming nearly constant at 1 month That of air cured concrete does not decrease after 14 d Curing is the most important of the factors considered. Storage in water as early as possible gives concrete of the lowest permeability Poorly cured concrete requires long periods of storage under water to make its impermeability equal to that of water-cured concrete Impermeability produced by good curing is permanent for 1·2·4 mixes Initial permeability is proportional to pressure After 7 days' test, specimens tested at 25, 50 and 100 lb. per sq. in were of equal permeability Reduction of permeability of specimens during testing is caused by a combination of silting, hydration and swelling, the amt attributable to each depending on the conditions of test and the compn of the concrete. RAYMOND WILSON

The deterioration of structures in sea water. *6th (interim) Rept of the Comm. of the Inst. of Civil Eng* **1925,** 40 pp —The rept contains repts on examn. of steel and Fe specimens exposed to air and sea water at Colombo, Halifax, Plymouth and Aukland by P. M CROSTHWAITE; on Teredo and Limnoria toxicity studies by GEO. BARGER; on examn of steel plates painted with protective coatings and exposed to sea water at Southhampton, by F. E. WENTWORTH-SHEILDS; on impregnation of timber with various poisons and exposure of test pieces, by S M. DIXON; and on conditions of specimens of timber exposed at Leith, by A. H. ROBERTS. ALFRED L. KAMMERER

The action of water and salt solutions on aluminous cements. G. HAEGERMANN AND HART. *Zement* **14,** 201–6(1925) —Aluminous cement is appreciably sol in distd. H_2O, 3 g of cement in 300 cc. H_2O for 3 hrs yielding 0 6 mg SiO_2, 72 4 mg R_2O_3, 53.2 mg. CaO and 1 0 mg. MgO per 100 cc of soln. In tap H_2O the soly is much less. The soly. in $Ca(OH)_2$ soln decreases with increasing concn In sea water and solns. of $CaSO_4$, $MgSO_4$, $MgCl_2$, the soly is low. Solns. of alkalies attack the cement. Sugar solns. (0.5% and up) retard the setting more than 48 hrs. H. F. K.

The strength of mortar and concrete as influenced by the grading of the sand. J. G. ROSE. *Public Roads* **7,** 106–7(1926) —A graph is given of relative strength and grading of 200 Colorado sands and gravels which were tested for tension and compression. The graph shows that there is an optimum grading of sand that will produce max. strength in concrete. A. E. GRAY

Prehydration of cement in new method of concrete mixing. W. B. JONES. *Eng. News-Rec* **96,** 850(1926).—During the construction of the Montebello filtration plant at Baltimore, Md., a large part of concrete was mixed by hydrating with the required amt of water prior to mixing with the aggregate. This method produces a product of uniformly good quality, eliminates possibility of lumps of cement in the concrete, provides facilities for handling the grout in bonding new concrete with an old pour, and makes possible a decided reduction in time of mixing. Fifteen seconds in the

mixer was found to be sufficient to give concrete of normal strength. The prehydration process and machine employed (described) have been patented. R. E. THOMPSON

The effect of calcium chloride on concrete. A. S. LEVENS. *Eng. News-Rec.* **97,** 214–5(1926).—The effect of 2, 3, 4 and 5% of $CaCl_2$ as an integral part of mix on the tensile strength of concrete was detd. The strongest concrete was that which contained 2% of $CaCl_2$, the higher percentages tending to weaken the concrete. During the earlier periods (3–7 days) the strength of concrete contg. 2% $CaCl_2$ was 40% greater than plain concrete. Similarly the strength under compression showed an increase of 106%. The shrinkage was 100% greater than plain concrete at 3 days, 50% at 7 days and 85% at 14 days and thereafter. R. E. THOMPSON

Vary mix design for concrete to be used at different ages. R. T. GILES. *Eng. News-Rec.* **97,** 510–1(1926).—Results of comparative tests of concrete made with and without accurate control of water are given. With accurate control the strength was 77% greater at 7 days and 30% at 28 days. In a series using fine aggregate only, of 21 gradations, the 7-day strengths were higher in every case with accurate control, while in some cases equal strengths were obtained at 28 days. One-year specimens will be tested in each series. Conclusions drawn from the expts. include (1) that fineness modulus is not a true measure of gradation but an indication only, and (2) that for ultimate strength accurate control of fine aggregate is of much more importance than accurate control of water. R. E THOMPSON

Specifying concrete by water-cement ratio alone. F. R. MCMILLAN. *Eng. News-Rec* **96,** 698–700(1926) —The procedure is described which is employed in applying specifications based solely on water-cement ratio in construction of new building of Portland Cement Assocn. in Chicago. The proportion of aggregates was governed entirely by the requirements of workability, with single limitation that the coarse aggregate should not be less in amt than the fine, nor more than twice the fine. The max. water-cement ratios specified were: (1) for 2900 lb. per sq. in. concrete, 6 U. S gals. per sack (94 lbs.) of cement; (2) for 2000-lb per sq. in concrete, $7^1/_2$ gals per sack. A curve for proportioning concrete by water-cement ratio is given and its application to small jobs is described. R. E. THOMPSON

Manufacture of cement from slurry in rotary kilns. T. RIGBY. Brit. 243,410, July 28, 1924. Mech. features for partly drying slurry before it comes into contact with the kiln wall

Magnesia cement mixtures. K. WERNER. Brit. 243,107, Jan. 24, 1925. MgO and $MgCl_2$ soln. are mixed with a filler which contains at least 30% of silicic acid in a form capable of reacting with excess $MgCl_2$. The residues obtained in the manuf. of alum and $Al_2(SO_4)_3$ may be used.

Oxychloride cement. J. A. RITCHIE. U. S. 1,602,212, Oct. 5. A compn. adapted for making molded articles is formed by treating a "body ingredient" such as sawdust with sufficient H_2O to render it damp to the touch but not enough to render it pasty and then mixing this material with MgO and $MgCl_2$. Cf. *C. A.* **19,** 3006.

Waterproofing cement mixtures, etc., with rubber latex. S. M. KIRKPATRICK. Brit 242,345, Aug. 6, 1924. A paste for incorporation as a waterproofing agent with cements, concretes, clay, earth and other materials is formed of raw or vulcanized rubber latex, a preservative such as "hexamine," Na silicate, K soap and H_2O, with or without gum arabic or other stiffening agent.

Cement kilns. I. E. LANHOFFER. Brit. 242,962, Nov. 14, 1924. Preliminary and final heating of the cement-forming material are effected in sep. kilns and a steam generator (with auxiliary firing provided for) is placed between the 2 kilns with a by-pass for direct passage of a portion or all of the hot gases to the preliminary heating kiln as desired.

Waterproofing concrete. A. B. TURK. U. S. 1,602,726, Oct. 12. The pores of concrete are impregnated with an insol. Ca salt such as Ca silicate and the material is then treated with a coating mixt. formed of paraffin, turpentine, CS_2 and gasoline.

Porous concrete. E. I. LINDMAN. Brit. 243,308, Nov. 24, 1924. A porous concrete comprises cement and a so-called "fermenting powder" such as Al to which is added not more than 80% of granulated coal or coke slag, ashes, coal, coke, furnace scoria, volcanic ashes, lava, chalk, pumice, trass, clay, pot-stone or wood at least 10% of which will pass a 9-mm. mesh. The "fermenting powder" may be added as a colloidal soln.

Mortar-forming process. J. H. DITTER. Can. 263,700, Aug. 24, 1926. An agent or admixture for mortar formers and mortar consists in a mixt. of Mg combinations and alkali silicate in colloidal form.

Slaking lime. R. & J. DEMPSTER, LTD. AND A. L. HOLTON. Brit. 242,865, March

26, 1925. An app. is described in which lime may be slaked with spent liquor from an $(NH_4)_2SO_4$ plant and heated and agitated with steam.

Calcareous plastic material. W. A. COLLINGS. U. S. 1,601,295, Sept. 28. A temporarily waterproofed fine granular material such as bentonite treated with mineral oil which is capable of swelling on access of H_2O is mixed with concrete as a filler and waterproofing agent.

Plaster. LAMBERT FRÈRES ET CIE. Brit. 243,015, Nov. 13, 1924. A slow-setting plaster is obtained by calcining gypsum at a temp. of 500–800° until it is completely dehydrated and acquires a sp. gr. of 2.7–2.8. It may be added to ordinary plaster.

Stucco. J. P. BEATY. U. S. 1,601,285, Sept. 28. Ground cork $1^1/_2$ lbs. is mixed with 100 lbs. of a mixt. of cement 2 and cinders 5 parts.

Paving materials. C. E. RAMSDEN. Brit. 243,418, Aug. 1, 1924. See U. S. 1,598,505 (*C. A.* **20,** 3552).

Paving material. F. W. CHAMBERLAIN. U. S. 1,603,192, Oct. 12. Sand grains are coated by heating and mixing them with a bituminous adhesive contg. 50–70% of dust by vol. and having a penetration of 120–130 and the heated coated sand grains are discharged into cold H_2O to harden the coating on the individual grains.

Paving. K DAMMANN. Brit. 243,391, Nov. 22, 1924. Non-bituminized "road metal" is bound with slightly bituminized granular stone. The binder also may be used for the wearing surface.

Combining bituminous emulsions with sand, sawdust or other solid materials. P. L. GEER and H. F. WIGGINS. U. S. 1,602,105, Oct. 5. Mech. features of prepg. compns. for paving, coating walls or roofs, etc.

Preserving wood. A ARENT. U. S. 1,602,959, Oct. 12. Wood is impregnated, at least superficially, with a concd soln. of NaCl and $SbCl_3$.

Preserving wood. H. D. HECKERT. U. S. 1,602,577, Oct. 12. Wood is subjected to the action of compressed air under a pressure of at least 40 lbs. per sq. in and then, without releasing the air pressure, is treated with a liquid preservative such as creosote oil at a pressure of at least 150 lbs per sq. in. until a portion of the desired impregnation has been effected, then is subjected to a "vacuum pressure of about 15 in. of Hg" for at least 20 min. and further subjected to liquid preservative under a pressure of at least 110 lbs per sq in

Preserving wood. TERMIT, LTD., AKTIESELSKAB. Brit. 243,595, Feb. 17, 1925. Wood is rendered resistant to attack by white ants by use of a soln. of alum contg. $Al_2(SO_4)_3$ and a small proportion of Al acetate obtained by reacting on alum with Pb acetate. Camphor and other substances may be added

Composition for preserving wood. A. C. HOLZAPFEL. U. S. 1,603,109, Oct. 12. A Hg compd. such as the oxide, and Zn stearate are used with varnish fumes and fuel oil.

21—FUELS, GAS, TAR AND COKE

A. C. FIELDNER

The rational analytical classification of fuels. C. BLACHER. *Feuerungstechnik* **13,** 69–70, 84–6, 95–8, 126–7, 148–52(1925).—Each fuel is represented by a point on a diagram, the coordinates being the percent of volatile matter in the fuel, and the percent of hydrocarbons in the volatile matter. In computing the latter, it is assumed that all the N appears in the volatile matter as such, and that all the O appears as water except for an O content of 1% in the coke Some progress has also been made on a direct method for detg the O in coal by heating in a stream of H_2. The two coördinates give the amt. of gas to be burned and the richness of this gas. On the diagram most fuels lie on a curved band passing from wood to anthracite, with a branch including cannels and oil. There are about 100 references to the literature, and 60 fuel analyses from many sources, some unusual. ERNEST W. THIELE

Unusual features of combustion chemistry. R. T. HASLAM AND J. T. MCCOY. *Power Plant Eng.* **30,** 941(1926).—The increase in the sum of the 2 gases as CO_2 decreases and O_2 increases is due to the "net" H which burns with the O_2 of the air to form water. K. C. BEESON

Fuel tests. HANS BROCHE. *Arch. Wärmewirtschaft* **7,** 237–9(1926).—In a plea for precise specifications for methods of analysis, B. gives the volatile matter content of 3 coals as detd. by 4 different much used methods. The variations may be over 3%, out of 20%. ERNEST W. THIELE

Firing-up tests of steam boilers. EBEL. *Arch. Wärmewirtschaft* **7,** 229–37(1926).—

E. gives the details of tests of the fuel required to bring banked boilers to full production. Gas, powd. coal and grate furnaces are included. ERNEST W. THIELE

A new combined sawdust-powdered coal furnace for steam boilers. ASCHOFF. *Techn. Blätter* **15,** 49; *Wärme & Kälte Tech.* **27,** 174–5(1925).—The mixed coal and sawdust are fed into the top of the furnace without air, the air being supplied through the furnace walls, which are double. The heat evolved per unit vol. of combustion space is high. Abstracts of 4 boiler tests are given. ERNEST W. THIELE

Coal and coke. R. W. MORRIS. *Mineral Ind.* **34,** 133–76(1925).—A review of the industry during 1925. A. B.

The why, when and how of storing bituminous coal. W. T. CONLON. *Power* **64,** 354–6(1926).—*Spontaneous combustion* can be avoided by preventing air circulation. A pile of coal 20 ft high, closely packed in layers, showed no indication of fire during a period of 26 months. D. B. DILL

Chemical evolution of the coal industry. M. PÉRILHOU. *Rev. ind. minerale* **1926,** 296–301. C. W. OWINGS

Vegetable substances and coal in their relation to chemistry. L. CRUSSARD. *Rev. ind minerale* **1926,** 219–34, 283–95, 303–16.—It is possible (1) to fix well defined chem classes, and in a very small number (cellulose, glucose, aglucone, coniferyl alcohol, pentose) which form, in vegetables, the essentials of the bases of combustibles; (2) to define a small number of transformations (oxidation, hydrolysis, aldolization, polymerization) which, acting simultaneously on these bases, according to known laws, create an extreme variety of new substances; (3) to group these substances into a small number of natural families (oxy- or hydrolignic acids, acids formed from the oxidation of hydrolignic acids, corresponding neutral compds , saccharo-humic compds.), whose phys. and chem properties may be described, as in simplified botany the natural families of plants are defined and described without assigning them to any class; (4) to illustrate transformation methods by simple laboratory experiments, and to show what the natural families are, by a small number of simple compds. (acetic acid, protocatechuic acid, vanillic acid, pyrocatechol, guaiacol, pyrogallol, quinone, dibenzofuran, etc) whose properties it is especially useful to know. C. W. OWINGS

Microstructure of coal. C. A. SEYLER. *Gas J.* **173,** 419–20(1926).—In abstracted form a résumé of present knowledge and investigations is given. A. E. GALLOWAY

X-ray studies of coal and coke. ANCEL ST. JOHN. *Trans. Am. Inst. Mining Met. Eng.* **1926,** (preprint), No 1587-F, 13 pp —A brief discussion and review of the study of coals by direct radiographs, Laue photographs and x-ray spectrographs W. B. P.

A comparison of vitreosil, illium-alloy and platinum crucibles for determination of volatile matter in coal. H. M. COOPER AND F. D. OSGOOD. *Fuel Science Practice* **5,** 381–5(1926).—Detns. of volatile matter were made upon coke, lignite anthracite and different types of bituminous coals, in crucibles made of Pt, illium-alloy and vitreosil All crucibles were of approx 10-cc. capacity, similar in shape and equipped with capsule lids. Tests were made by the standard A. S. T M method at 950° in a vertical elec furnace. In testing coke, anthracite and coking coals the results obtained with vitreosil and illium-alloy crucibles agreed within the limits of exptl error with those obtained by using Pt crucibles. In testing lignite and noncoking coals the results with illium-alloy crucibles checked more closely than with vitreosil, both being much lower than the results obtained with Pt crucibles. The use of vented lids on vitreosil crucibles caused little difference in results. Neither variations in rate of heat transfer through the different crucibles nor wall thickness materially affected the results Vitreosil and illium-alloy crucibles gave reliable results except for high-volatile noncoking coals. The use of Pt permits more rapid working because its lower sp. heat necessitates a min. amt of time for heating, cooling to weighing temp., and burning off. D. A. R.

The Dutch standards for the determination of volatile matter in coal. S. DE WAARD. *Feuerungstechnik* **14,** 275–8(1926).—The literature relating to the factors influencing this detn. is reviewed, and the official method adopted by the Dutch Institute for Fuel Economy is given. This is substantially the American method, using gas, with min. details as to crucible weight and dimensions, gas flow, etc. ERNEST W. THIELE

The colloid-briquet process. FELIX BRAUNEIS. *Montan. Rundschau* **18,** 529–30 (1926).—In briquetting brown coal approx. 25% is ground to "colloidal" size, this acting as a binder for the rest, the pressure required for briquetting being reduced to about 20% of that normally used Some data are given. W. B. PLUMMER

Future trends in automotive fuels. A. C. FIELDNER AND R. L. BROWN. *Ind. Eng. Chem.* **18,** 1009–14(1926). E. J. C.

Tests of benzene as a motor engine fuel. ANON. *Oil Eng. Techn.* **7,** 355(1926).—The report of the British National Benzole Research Committee. The resin-forming

tendency of benzenes was studied by means of engine tests on refined and unrefined benzenes. It is concluded that gum formed in the engine valves arises from nonvolatile resinous matter already present in the benzene. Very little gum is formed by polymerization and oxidation of volatile unsatd constituents caused by contact with hot parts of the induction, etc. The method of C deposition is described. It is tentatively concluded that benzenes free from weighable quantities of nonvolatile resinous matter at the time of use are suitable for motor fuels. M. B. HART

Preparation of liquid hydrocarbons by the direct hydrogenation of coal by the Bergius process. A. GRÉBEL. *Génie civil* **88,** 176(1926). JACK J. HINMAN, JR.

An engine that runs on dust. W. A. NOEL AND RUDOLPH HELLBACK. *Power* **64,** 402–4(1926)--Expts indicate the possibility of designing an engine which uses grain dust for fuel D. B. DILL

The Landmann system of combustion. ANON. *Feuerungstechnik* **13,** 297(1925).—The system consists in drawing off from the grate with a fan the gases arising from the carbonization of the coal on the first part of any chain or step grate, and putting them back under the grate ERNEST W. THIELE

The determination of the combustion temperature, allowing for dissociation. WILHELM GUMZ *Feuerungstechnik* **14,** 261–3, 273–5(1926)—The method of calcg the theoretical flame temp is described, graphs being used Two useful simplifications are pointed out: the dissocd gases have very nearly the same heat capacity as they had before dissocn.; and the heat rendered unavailable by dissocn. is nearly the same, whatever the excess air ERNEST W. THIELE

Flue gases and draft. P H. PARR. *Intern. Sugar J.* **28,** 80 3(1926).—Chimney height should be based on difference in wt between hot stack gases and outside air. The principal uncertainty is the av temp of the gases in the stack. The mean temp may be taken, for lack of better data, as 5–10% lower than at the base. Too large a cross-section may cause poor draft from excessive cooling due to low gas velocities. W. L. BADGER

Recovery of flue gas heat. WEBER. *Warme & Kalte Tech.* **27,** 11(1925).—A patented cross-flow cast-Fe air preheater is described The air passes through many square ducts with internal ribs, set rather close, with flue gas passing around them. ERNEST W. THIELE

Operation of the Ljunstrom air preheater. B. G. BROLINSON. *Iron & Steel Can.* **9,** 227–36(1926)—This particular preheater employs the regenerating principle, carrying the heat from the escaping flue gases to the incoming air. This is accomplished by a slowly rotating regenerator contg. a very large heating surface within narrow limits At the same time the counter-flow principle is applied. An av recovery of 70% of sensible heat in the flue gases is accomplished With preheated air introduced to the furnace more fuel can be burned on the same grate area. Photographs are shown and the operation is described H C PARISH

The distribution of temperature in shaft stoves. H. STRACHE. *Feuerungstechnik* **13,** 253–5(1925)—Mathematical. By making various assumptions a formula is developed giving the temp at any point at any time of a mass of well-conducting material, such as a blast furnace stove, heated by means of a gas passing through it. E. W. T.

Domestic heating. MARGARET FISHENDEN. *Gas J.* **173,** 540–1(1926).—In abstracted form the essentials of a lengthy paper are given citing thermal waste, central heating, coke stoves, intermittent heating and coal conservation A. E. GALLOWAY

Determining presence of air in gas. F. P. PETERSON. *Oil & Gas J.* **25,** No. 12, 146(1926). -Gas-analysis equipment is listed and described for the detn of O, CO_2 and CO M. B. HART

The Strache gas generator in the gas industry. A. GRÉBEL. *Génie civil* **87,** 368–73(1925).—The app developed by Hugo Strache of Vienna is described and shown by drawings and photographs. JACK J. HINMAN, JR.

New methods of gas purification. F. W. SPERR, JR. *Gas Age-Record* **58,** 73–6, 80(1926).—Liquid purification process improvements and the Sperr recovery process reactions and operation are discussed. Operating costs of gas purification by the latter process are tabulated. H. G. BERGER

Utilizing a by-product of gas manufacture. F. H. RIPLEY. *Gas Age-Record* **58,** 79(1926).—Coke breeze is recommended for insulation of cold storage floors. H. G. B.

Recuperative oven plant at Kalamazoo, Michigan. ANON. *Gas Age-Record* **58,** 41–2(1926).—Descriptive, with operating data. H. G. B.

Past and present trend of development in gas manufacture. J. A. PERRY. *Gas Age-Record* **57,** 583–6(1926).—An historic review showing the progress made in the gas

industry from its inception to the present. Modern methods of mfg. gas are discussed and held to be sound regardless of claims for low-temp. carbonization. H. G. BERGER

Producer gas and by-product recovery. JOHNSTONE-TAYLOR. *Gas Age-Record* **57,** 587(1926).—The Neilson system for a by-product producer plant is described diagrammatically. Hot producer gases are passed through coal in a rotating inclined retort effecting devolatilization of the coal to some extent. The coke produced is used in gas producers for the production of gas used in steam generators, as well for the distn. of the coal. By-products are recovered; 35-40 M cu ft of 200 B.t.u. gas per ton of coal are recovered. Surplus coke is produced and may be used as domestic fuel. H. G BERGER

Refractories for generator linings. I. Clinker formation and general properties of refractories. H. H. BAUMGARTNER *Am. Gas J.* **125,** 255-8(1926).—The least clinker trouble results from generator coal whose ash consists of nearly equal parts of SiO_2 and Al_2O_3 with small amts to traces of CaO, MgO, alkali and Fe, and which fuses at 2300-2500° F. Refractories themselves are the most adaptable of many factors in clinker control. SiC and Al_2O_3 are efficient, especially Al_2O_3, since it resists slag action, does not shrink or oxidize, and is strong. The ideal structure is grossly crystalline within the refractory to resist phys shock with a dense surface to prevent penetration. **II. Fundamentals of design of shapes and cooling shapes.** *Ibid* 280-3.—The advantages claimed for linings of SiC compared with firebrick are: much longer life, increased capacity of generators, practical elimination of clinker troubles, easier cooling and fuel economy. H. F K.

Relation between heating value of gas, the required volume of combustion air, and the combustion products. HANS FAHRENHEIM. *Gas u. Wasserfach* **69,** 838-40(1926).—A discussion with detailed tabulations W. B. PLUMMER

A new gas burner system. A. MIRBACH. *Feuerungstechnik* **14,** 279(1926).—In the burner described the gas enters the narrow end of the frustum of a cone through an adjustable annular opening The air enters through many small ports in the side of the cone, which is of ceramic material. Both gas and air are under pressure. E. W. T.

Tests of blast furnace gas burners for boilers. FRIEDRICH LÜTH. *Arch. Wärmewirtschaft* **7,** 192-4(1926)—The pressures required for different gas rates and amts of excess air are given for 4 burners, together with the results of several boiler tests with each ERNEST W THIELE

European gas developments. C. H. S. TUPHOLME. *Gas Age-Record* **57,** 657-8 (1926); cf. *C. A.* **20,** 1899- Description of carbonizing retorts. H. G. BERGER

Some characteristics of gas combustion. O. L. KOWALKE. *Gas Age-Record* **57,** 725, 730(1926).—A review. H. G. BERGER

Recent developments in the pier process. R. A. WAIT. *Gas Age-Record* **57,** 615(1926). H. G. BERGER

Reflections on ammonia recovery at gas works. J. S. UNGER. *Gas Age-Record* **58,** 142 6(1926). H. G. BERGER

Neutralization of sulfate of ammonia and supplementary notes on manufacture. C BATEMAN. *Gas World* **84,** 280-3; *Gas J.* **173,** 748-51(1926); cf. *C. A.* **19,** 3367.—B gives the results of his study with data and the method developed. Particular attention is given to the neutralization of the salt. By expt $(NH_4)_2CO_3$ was shown to be suitable for neutralization both as to efficiency and labor saving, and after a period of one month. A diagram of a semidirect NH_3 recovery system is shown. A. E. G.

Neutralization of ammonium sulfate. A. THAU. *Gas u. Wasserfach* **69,** 832-4 (1926).—Discussion of difficulties with an acid product, and of methods of neutralization. W. B. PLUMMER

The continuous distillation of water-gas tar. ANON. *Gas Age-Record* **57,** 837, 848(1926).—A plant bringing the tar into contact with a molten metal kept at a definite temperature is described. H. G. BERGER

Future trends in low-temperature carbonization. S. W. PARR. *Ind. Eng. Chem.* **18,** 1015-6(1926). E. J. C.

The agglutinating value of coal. M. BARASH. *Gas World* **84,** 68; *Gas J.* **173,** 276-80(1926); cf. *C. A.* **20,** 2741.—A coal of the highest proportion of agglutinant (β and γ compds) does not necessarily form the best coke. Coal is composed of a fusible portion with cementing properties and inert material. B. aims to establish the impossibility of detg. the amt. of cementing material and its strength and covering power and that the inert material exerts a remarkable influence. B. stresses the latter object, and suggests better cokes would result by removal or destruction of part of the agglutinant, weathering, chem., or other treatment of the coal, and by blending. The method is detailed and curves and photographs are given. A standard agglutinant for comparison

of inert matter is defined, and the relation between swelling power and agglutinating value is discussed. A bibliography is given. A. E. GALLOWAY

By-product coke-oven practice. XII. R. A. MOTT. *Fuel Science Practice* **4**, 528–46(1925); cf. *C. A.* **20**, 494.—A discussion of (1) coke quality as related to coal used, (2) fractures in coke, (3) the path of travel of the gases in the oven. D. A. R.

Relation of by-product coke ovens to the natural gas supply of the Pittsburgh district. H. J. ROSE. *Trans. Am. Inst. Mining Met. Eng.* **1926** (preprint), No. 1593-F-G, 10 pp.—Since the present trend in coke-oven construction and operation is toward oven heating with producer gas, large supplies of coke-oven gas become available as potential replacements for natural gas. W. B. PLUMMER

The Sulzer system of dry coke cooling. ERNST BLAU. *Gas Age-Record* **58**, 135–6, 145(1926).—A discussion of quenching *versus* dry cooling. The Sulzer system is described and sketches are given. Actual operating plants are discussed. H. G. B.

Relation of chemistry to development of power (HASLAM, *et al.*) **13.** Specifications for lining and checker brick for water gas manufacture (BRADY) **19.** Recovery of gas from the Decatur Imhoff tanks (HATFIELD) **14.** The year's progress in illumination (CADY, *et al.*) **4.** Progress in ore dressing and coal washing in 1925 (RICHARDS, LOCKE) **9.** Determination of phenol in crude cresol (QVIST) **7.** Gas, vapor and liquid (JÜPTNER) **2.** Cracking and hydrogenating coal (Brit. pat. 242,876) **22.** Apparatus for distilling coal (U. S. pat. 1,602,819) **22.**

Carbonizing coal. W. RUNGE. Brit. 242,621, Nov. 6, 1924. Pulverized coal is preheated by suspension in a heated oxidizing gas, *e. g.*, air at a temp. of about 345° in the case of bituminous coal to destroy its agglutinating properties, and the powd. fuel is then carbonized by showering it through an ascending current of gas at a higher temp., *e. g.*, the combustible gas formed at a temp. of about 535°. Distillates may be recovered. An app. is described. Brit. 242,622 specifies introducing coal into the top of a carbonizing chamber wherein it gravitates through a zone having a temp. of 455–635° countercurrent to a gas formed by burning a portion of the material or a combustible gas or both at the bottom of the chamber in a limited supply of air. Distillates are withdrawn at the top and partially distd. coal at the bottom. An app. is described. Brit. 242,623 specifies showering powd. fuel through a limited supply of oxidizing gas in a reaction chamber, the upper portion of which is flared to provide a larger cross-section in which the gases have a reduced velocity as they pass around a preheater through which the fuel is fed. Cf. *C. A.* **19**, 3582

Low-temperature distillation of coal. J. NEATH and W. CHANEY. Brit. 242,435, Nov. 8, 1924. In operating a vertical retort for low-temp. distn. of coal in connection with a water-gas producer, the producer gas during the "blow" passes through regenerators in which it is burnt by successive addns. of secondary air and is carried to a combustion chamber in the retort setting, and during the "run" the water gas is passed through the charge. An app. is described.

Coking coal or lignite. SOC. L'AIR LIQUIDE SOC. ANON. POUR L'ETUDE ET L'EXPLOITATION DES PROCÉDÉS G. CLAUDE. Brit. 243,665, Nov. 28, 1924. At the end of the heating process the atm. present in the retort or oven is displaced by a current of N, air or combustion products so that the H and CH_4 are liberated from the coke. The gases used may be superheated and H and N may be obtained from them by partial liquefaction for use in NH_3 synthesis.

Coking coal. KOPPERS CO. Brit. 243,414, July 30, 1924. A charge of coal is externally heated in a mass which is thinner at its lower than at its upper part, and, when the thinner part is practically completely coked, steam is introduced into this part. Provision is made for withdrawal of distillates.

Benzene. I. W. HENRY. U. S. 1,601,213, Sept. 28. Hydrocarbonaceous material such as powd. bituminous coal mixed with 10% of $CaCO_3$ is heated in a high-frequency oscillating elec. field to generate gas and the C particles suspended in the gas are ionized and treated with H from an external source to form an enriched hydrocarbon gas. This gas is scrubbed to remove free C, tarry substances and other residue and C_6H_6 is condensed from the scrubbed gas.

Apparatus for destructive distillation of coal, peat, shale or other bituminous materials. A. M. SMITH. U. S. 1,602,128, Oct. 5.

Ionizing retort for distillation of hydrocarbonaceous or other materials. I. W. HENRY. U. S. 1,601,212, Sept. 28.

Fuel mixture. E. MALLOCK. U. S. 1,601,501, Sept. 28. Salt water peat is mixed

with about an equal quantity of coal and the material is carbonized in an oven for several hrs. to form a clinker-like product adapted to be further mixed with coal to improve the circulation of air through it when burned.

Carbonizing fuel briquets. E. GEVERS-ORBAN. Brit. 242,869, April 6, 1925. A vertical retort is used which is heated externally from the top downwards and briquets are introduced immediately into the hot zone. A portion of the distillates, taken off at the top, is returned into the bottom of the retort.

Fuel briquets. L. A. WOOD and MINERALS SEPARATION, LTD. Brit. 242,352, Aug. 6, 1924. Briquets, *e. g.*, those obtained by flocculating finely divided fuel in H_2O or other fuel briquets contg. hydrocarbon binders, are subjected, under nonoxidizing conditions, to the action of superheated steam at a temp. of 100–300°, and evolved vapors may be condensed and recovered, while the H_2O content of the fuel is reduced and rendered "smokeless" and waterproof.

Distilling and coking fuel. A. J. A. HERENG. Brit. 242,411, Oct. 11, 1924. In distg. fuel by direct heating by hot gases produced in an auxiliary externally heated combustion chamber, the quantity of air mixed with the fuel in the combustion chamber is adjusted so that CO or CO_2 mixed with N is produced and enters each of a series of retorts contg. the fuel undergoing distn. and gases from the distn. retorts serve for preheating fuel in other retorts.

Dissociating steam as a fuel. T. J. J. WASLEY and F. G. SIBILLA. Brit. 242,333, July 31, 1924. Steam is projected onto highly heated surfaces of refractory material or metal which is not readily fusible or upon solid fuel in a boiler furnace to effect dissocn. of the steam so that its elements may immediately recombine The furnace is preliminarily heated to incandescence electrically or by steam and oil or other fuel.

Motor fuel. E. JOHANSEN. U. S. 1,601,215, Sept. 28. Compds. of a metallic oxide, *e g*, PbO or an alkali plumbite, with "sour distillate compds.," are dissolved in petroleum hydrocarbon material such as gasoline or in C_6H_6, alc. or ether. U. S. 1,601,-216 specifies treating "sour distillates" with oxides such as PbO to form a fuel component These fuels are suitable for engines working at high compression.

Liquid motor fuel. J. F. P. DE RIBOISIERE. Brit. 243,357, Nov. 18, 1924. See U. S. 1,534,573 (*C. A.* **20**, 495).

Drying or low-temperature distillation of fuel. METALLBANK UND METALLURGISCHE GES AKT.-GES. Brit. 242,618, Nov. 4, 1924. Fuel is dried or subjected to low-temp. distn by the action of hot gases generated in a furnace between 2 retorts and connected with them by chambers through which gases are passed to be heated and to mix with the hot combustion gases from the furnace before entering the retorts. A drying and carbonizing app. may be superimposed and heated by the same furnace.

Fuel briquets. L. WEBER. Brit. 243,129, Oct. 13, 1924. Briquets are formed with holes or channels so placed that the walls bounding the holes do not exceed in thickness the "burning depth" of the fuel mixt. which may be formed, *e. g.*, of gas coke up to 6 mm grain with about 25% of coal dust and 4% sorel cement which, when formed under a pressure of 75 kg. per sq. cm, has a "permissible burning depth" of 1 cm. and when formed under a pressure of 25 kg. has a burning depth of 2 cm.

Hydrocarbons. F. BERGIUS. Can. 263,477, Aug. 17, 1926. Gas for the hydrogenation of C and hydrocarbons is obtained from gases contg. CH_4 and H_2 by subjecting them to treatment with steam at different temps. in successive stages, and also to a treatment to remove CO_2.

Hydrocarbon and alcohol mixture. M. D. MANN, JR. Can. 263,426, Aug. 10, 1926 A compn. of matter comprises a liquid petroleum hydrocarbon, a primary alc. and secondary butyl alc. in mixt. which is stable without a blending agent.

Coal gas. W. J. MURDOCK, E. E. LUNGREN and O. B. EVANS. U. S. 1,602,242, Oct 5. Coal of relatively high volatile content is arranged in an annular column between inner and outer refractory heating walls so spaced as effectively to heat the entire column by radiation and the column is vertically blasted with air and steam, alternately.

Gas producer. F. H. WAITE and G. W. DAVEY. Brit. 242,473, Dec. 29, 1924.

Gas producer. SOC. ANON. D'EXPLOITATION DES BREVETS COUSIN DITE LE CHAUFFAGE INDUSTRIEL. Brit. 242,597, Nov. 6, 1924. The air blast for a producer is moistened by bubbling through H_2O in the ash pit.

Gas producer operation and synthetic ammonia production. H. A. HUMPHREY and SYNTHETIC AMMONIA & NITRATES, LTD. Brit. 242,741, Sept. 24, 1924. In generating producer gas from showers of powd. or atomized fuel, the blast of steam and air or O required for the reaction is preheated to above 900° by the sensible heat of the prod-

uct. Two regenerators are used and the cooler parts of the regenerators may be lined with a catalyst for producing NH_3 by reaction of the gas produced with steam.

Gas retorts. T. R. WOLLASTON. Brit. 243,169, Dec. 1, 1924. In vertical or inclined gas-making retorts, the fuel is stirred and pre-coked in the upper portion (to which heat is supplied by the hot gases from and by contact with the lower portion and, if desired, also by external flues or an external heating chamber) and passes downwardly from one stage to another of the retort under the action of stirrers in a vertical shaft.

Rotary gas scrubber. GAS LIGHT & COKE CO. AND E. W. EVE. Brit. 242,404, Oct. 7, 1924.

Apparatus for treating gas with purifying or enriching liquids. G. J. HILL and F. J. MOORE. U. S. 1,602,530, Oct 12

Apparatus for testing the calorific value of gases. BOARD OF TRADE AND C. V. BOYS. Brit. 243,028, Nov. 17, 1924.

Apparatus for making air gas. H. FOERSTERLING. U. S. 1,601,303, Sept. 28.

Separating dust from flue gases, etc., by water sprays. BRITISH SOOT BLOWER CO., LTD. AND A. U. MERRYLEES. Brit. 243,128, Oct 10, 1924. An app is described.

Apparatus (with concentric chambers) for distillation and gasification of peat, brown coal, lignite and similar materials. F. KRAUSS Brit. 243,534, Dec 8, 1924.

Incandescent gas mantles. T. TERRELL. U. S. 1,601,746, Oct. 5. An incandescent mantle in the marketable soft condition has a fabric of lustra cellulose, the elementary fiber of which has a thickness of 0 5 3 deniers Italian silk measurement.

Catalytic decomposition of tars, mineral oils, etc. M. MELAMID. U. S. 1,602,310, Oct. 5. The sepn of C and pitchy substances in the catalytic decompn of tars, crude mineral oils, etc., is prevented by highly dispersing the material in the presence of H so that it is in a foggy, gas like condition and treating the material at a high temp with a metal catalyst which liquefies at the reaction temp (which may be about 500° with crude petroleum) and which does not form carbides.

Coke briquets. MIDLAND COAL PRODUCTS, LTD. AND C. INGMAN. Brit. 242,783, Nov 7, 1924 A caking coal is mixed with about 2 33 times its wt. of a coal of low coking index (both finely divided) and about 5% of a binder such as pitch is added to the mixt. Compressed briquets are formed from it which are then treated in a vertical retort supplied with air or steam or both and carbonization is effected by consuming a small proportion of the material of the briquets

Coke oven heating wall of silica. A. ROBERTS. U. S. 1,601,741, Oct. 5. Specific dimensions are given.

22—PETROLEUM, LUBRICANTS, ASPHALT AND WOOD PRODUCTS

F. M ROGERS

The future of the chemistry of petroleum. J. F. NORRIS. *Ind. Eng. Chem.* **18**, 1019-21 (1926). E. J. C.

Petroleum and petroleum products. ARTHUR KNAPP. *Mineral Ind.* **34**, 513–45 (1925).—A review of production and refining of petroleum and products in the U. S. and foreign countries A. B.

The Pechelbronn petroleum refinery. R. P. *Chaleur et industrie* **7**, 487–98 (1926).—Description of the oil mining and refining processes used at Pechelbronn. A. PAPINEAU-COUTURE

The liability to explosion of carburetted atmospheres in petroleum and distillate storage tanks. A. WILLIAMS-GARDNER. *J. Inst. Petr. Techn.* **12**, 336–40(1926).—An examn. has been made of the atm. existing in storage and process tanks contg. inflammable liquid, which shows that no explosive mixts. are present. A Bone and Wheeler gas analysis app. was used. The gas content consists of a higher proportion of the lowest paraffins. M. B. HART

Mineral cordage oils. W. L. BROOKE. *Philippine J. Sci.* **30**, 213–8(1926).—The requirements for cordage oils are: good penetrating ability, permanent neutrality, low S and volatile matter; for ship rope also low emulsifiability with water. Oils with paraffin base are believed to cause the desirable yellow color, those with asphalt base the blackish gray discoloration of the rope on aging. The 8 oils on the market had the following consts.: volatility loss 0.20–0.53%, d 0 888–0 940, viscosity$_{100}$ 91–146 (Sayboldt), flash point 152–174°, fire point 172–202°, 0 18–0 50% S, *R. E.* no. (emulsifiability with water detd. according to the Tagliabue (Brooklyn) Manual for Petroleum Inspectors) 4.0–7.0. MARY JACOBSEN

The oil fields of the Maracaibo Basin. C. M. HUNTER. *J. Inst. Petr. Techn.* **12,** 235–46, Discussion 246–56(1926). M. B. HART

Sodium carbonate as flooding agent revises estimate on oil reserves. ARTHUR KNAPP. *Oil Weekly* **1926,** No. 9, 28–9.—The action of Na_2CO_3 as a flooding agent is described. The soda soln replaces the oil which wets the sand grains and permits the recovery of the oil by flotation. The salt water is pushed ahead of the carbonate soln., and thus prevents the deposition of insol. compds. M. B. HART

Use of soda ash. C. E. KERN. *Oil & Gas J.* **25,** No. 13, 31, 157(1926).—A satd. soln of soda ash in cold water hydrolyzes to about 0.4 *N* NaOH, which is the optimum concn for driving petroleum from oil sands M. B. HART

Microthermal observations of some oil shales and other carbonaceous rocks. TAISIA STADNICHENKO AND DAVID WHITE. *Bull. Am. Assoc. Petr. Geol.* **10,** 860–76 (1926); cf *C. A.* **20,** 3275—These exptl. studies are planned (1) to show whether the various fossil constituents in an oil shale or other carbonaceous rock are characterized by differences in their chem. constitution that will result in differences in temps. at which they volatilize or undergo change of state; (2) to det. whether and how far the same kinds of fossil constituents react at the same temps in shales more highly carbonized by natural processes, (3) to secure such information as may be gained by the same methods as to the stages of carbonization at which the various fossil components fail to give evidence of chem distinction; (4) to show what physical constituents of the "shale" yield oils or other condensable distillates by heat treatment; and (5) to secure data for the detn of the proportions and qualities of the distillate (with references as to natural oils) that are derived from one fossil commodity or another. The methods are new and are not yet fully developed and the exptl. results are but partly interpreted. For the completion of objectives 4 and 5, retort distns of check samples and chem. anns of the products are required to supplement the microfurnace observations. C L C.

The Konradson demulsification test for turbine oils. L. A. GLOUCHMAN AND S L ALECHENA. *Azerbaidj. Neft. Choz.* **51,** 75–7(1926); *Chimie et industrie* **16,** 58 (1926) Pass steam for exactly 10 min into a 250-cc graduated cylinder contg. 20 cc H_2O and 100 cc of oil, place in a water bath at 55° for 1 hr., and note the amt of H_2O (either clear or milky), of emulsion and of oil, and the H_2O content of the oil. With a given oil the rate of sepn of the emulsion may vary, but the final result is const.; the H_2O content of the sepd oil cannot always be detd. with the desired degree of accuracy; on the whole the method yields fairly accurate results. Application of the test to turbine oils prepd by treating ordinary machine oil with 1, 2 and 3% of SiO_2 gel showed that the oil was improved and did not give any emulsion. The method is suitable for adoption as a standard test, except that it is unnecessary to det. the H_2O content of the oil and the height of the emulsified layer is the only important consideration. A. PAPINEAU-COUTURE

The use of antioxidants in oils. ANON. *Rubber Age* (N. Y.) **20,** 27, 30(1926).—Aldol α-naphthylamine ("*Agerite*") has already proved itself of great value in retarding the oxidation and therefore the deterioration of vulcanized rubber. Similarly its addn. to mineral oils, in which it is sol, stabilizes the oils so that their elec. resistivity after prolonged heating is far higher than the corresponding untreated oils under the same conditions The property has already been utilized on a com. scale in the production of [illegible] C. C. DAVIS

The production of gasoline substitutes and solvents. R. T. ELWORTHY. *Gas Age-Record* **58,** 137–8, 146(1926).—Discussion of various investigations. H. G. B.

Ethyl gasoline. P. TRUESDELL. *Nat. Petr. News* **18,** No. 38, 21(1926).—Manuf. described.

... unsatd. hydrocarbons, by H_2SO_4 of 90, 92, 94 and 100% strength. Based on these results the proposed method consists of detn. of unsatd. hydrocarbons by treatment with 94% H_2SO_4 (using 2 vols. of acid and cooling with ice) if the sample contains less than 20% aromatics. If the sample (of blended motor fuel) contains more than 20% aromatics, 92% acid is used to det. the unsatd. content. In either case a 2nd sample is treated similarly with 100% acid to det. both unsatd. and aromatic content, the latter then being found by difference. W. B. PLUMMER

New testing method solves tough problem for gas plants. E. D. CUMMINGS. *Petr World, Calif.* **11,** No. 9, 108–10(1926).—A distn. method for detg. the % gasoline held in rich absorbing oil is described. M. B. HART

The charcoal process pro and con. EMBY KAYE. *Nat. Petr. News* **18,** No. 35, 21(1926).—The charcoal absorption process is run at a 50% saving in initial investment as well as a saving in maintenance over the oil process. Difficulties encountered in the charcoal process include the corrosion of screens and the reactivation of the charcoal. M. B. HART

Use pipe still to reduce fuel oil. C. O. WILLSON. *Oil & Gas J.* **25,** No. 16, 152–3 (1926).—The Kanotex installation is described which uses Gray polymerizers with the Jenkins cracking units. M. B. HART

Water tubes in pipe stills would cool oil tubes and make needed steam. B. N. BROIDO. *Nat. Petr. News* **18,** No. 34, 78, 80, 82; No. 35, 43, 45–6, 48; No. 36, 67–8, 71–2, 73(1926).—Efficient operating conditions for pipe stills are discussed. The Reiher and Reitschell heat-transmission coeff is developed. M. B. HART

Physical and chemical properties of paraffin wax, particularly in the solid state. J. A. CARPENTER. *J. Inst Petr. Techn.* **12,** 288–315(1926).—On fractionation of wax from Burma crude, compds. ranging from $C_{21}H_{44}$ to $C_{34}H_{70}$ were obtained. The transition from needle-shaped prisms to rhomboid plates or leafy masses occurs at 10–15° below the m p. The crystal form depends upon the solvent used, rate of cooling and on the wax used. Data are tabulated to show transition points, expansion and d. of various waxes. Wax dissolves 7–15% of its own vol. of air at ordinary temp. A test for detg. the breaking strengths of waxy materials is described. Amorphous mineral jellies and cryst. waxes belong to different chem. classes of compds. and cannot be transformed from one to the other. M. B. HART

Further investigation of the liquid reaction products obtained by the action of hydrogen on paraffin wax under high pressure at 450°. Contribution to the knowledge of Berginization. H. I. WATERMAN AND A. F. H. BLAAUW. *Rec. trav. chim.* **45,** 284–95 (1926). (In English) —400 g. Rangoon paraffin (84 6% C, 14 8% H) were heated in an autoclave (cf. W. and Perquin, *C. A.* **20,** 3560) under an initial H_2 pressure of 110 atm. for 90 min at 445–55° (observed pressures 280–90°). On the av. 360 g. was recovered from the app. 3502 g. obtained in this way gave 1343 g. boiling below 150° and 2036 g higher-boiling material which contains, apparently much unchanged paraffin. The gasoline boiling up to 150° was carefully fractionated and full details are given. Conclusion: Gasoline fractions obtained on "berginizing" paraffin wax under the conditions used contain large quantities of the successive members of the satd methane hydrocarbons and also probably about 10% of olefins. C_6H_6 and PhMe are absent or present only in extremely small quantities. E. J. WITZEMANN

Lubrication. F. A. HOFF. *Oil Trade* **17,** No. 9, 26(1926) —Castor oil blends as lubricants give better lubrication and protection to moving parts with a min. of C formation than pure castor oil. Castor oil does not break down readily under heat nor congeal in cold weather, forms a tight piston seal, and having no affinity for gasoline remains on the cylinder and prevents crankcase diln. M. B. HART

The application of colloid chemistry to lubrication. RAYMOND SZYMANOWITZ. *J. Chem. Education* **3,** 909–14(1926). E. J. C.

The study of lubrication by electrical methods. H. SCHERING AND R. VIEWEG. *Erdöl und Teer* **2,** 602–4, 619, 620(1926).—A detailed discussion of methods of calcn. and of graphical treatment of results in the study of lubricating films by detn. of the elec. capacity of the oil film, this being obviously a function of the thickness of the film and the properties of the oil. W. B. PLUMMER

"Saturation" of the petroleum lubricant hydrocarbons as shown by their reaction with bromine. C. F. MABERY. *J Am. Chem. Soc.* **48,** 2663–4(1926).—A fraction of a Pa. oil, b_{30} 280–2°, and 1 of an Ill oil, b_{30} 275–80° in CCl_4, treated with Br, give a Br substitution product and liberate 1 mol. HBr; the Br derivs. decomp. 100–20° with elimination of HBr; they react readily with EtOH-KCN and diln. with H_2O ppts. the alkyl cyanide. Sapon. of these cyanides gives dense, oily acids. This would indicate that this fraction of petroleum is satd. C. J. WEST

Fire-point carbon test. SAMUEL P. MARLEY, C. J. LIVINGSTONE AND W. A. GRUSE. *Ind. Eng. Chem.* **18,** 1094(1926).—Critical comments are made on the test proposed by Byrd and Vilbrandt (*C. A.* **20,** 2745), and objections to claims of parallelism between test results and performance of the lubricant in engine cylinders. L. R. ADKINS. *Ibid* 1094–5.—Similar to foregoing. W. B. PLUMMER

Asphalt. PREVOST HUBBARD. *Mineral Ind.* **34,** 86–94(1925).—Consumption of asphalt and related hydrocarbons, production, tests and specifications are discussed. A. B.

Artificial asphalts prepared with sulfur. SEDLACZEK. *Teer* **24,** 436–7(1926).—

A no. of German patents covering products from S with coal tar, pitch, various oils etc., are cited and briefly discussed. W. B. PLUMMER

Wood tar and its technical application. E. J. FISCHER. *Teer* **24**, 434–6, 453–7 (1926).—A general discussion of the compn. and properties of various wood tars and of their utilization in waterproofing, medicinals, etc. A no. of patents covering utilization are cited. W. B. PLUMMER

Relation of chemistry to development of power (HASLAM, *et al.*) **13.** Organic theories of oil origin (CLARK) **8.** The fluorescence of oils in ultra-violet light (CRONER) **27.** Adhesion (HARDY, NOTTAGE) **2.** Partial evaporation of trade waste eliminates taste in water [wood-distillation waste] (MCNAMEE) **14.** Were diatoms the chief source of California oil? (CUNNINGHAM) **8.** The relation of Foraminifera to the origin of California petroleum (STIPP) **8.** Original source of oil in Colombia (ANDERSON) **8.** The subsurface geology of the Big Lake oil field (SELLARDS, PATTON) **8.** Filter for gasoline (Brit. pat. 242,917) **1.** Treating mineral oils with purifying agents (Brit. pat. 243,113) **13.** Catalytic decomposition of mineral oils (U. S. pat. 1,602,310) **21.** Apparatus for destructive distillation of shale (U. S. pat. 1,602,128) **21.**

Cracking hydrocarbon oils. W. F. FARAGHER, W. A. GRUSE and F. H. GARNER. U. S 1,601,727, Oct. 5. A body of oil in a still is heated to cracking temp. by external heating of the still and circulation of the oil within the still is effected by introduction of upwardly flowing currents of gas, *e. g*, fixed gas formed by the oil cracking, which act on the "air-lift" principle, between vertical division plates within the still spaced at their upper and lower ends from the still walls. U. S. 1,601,728 specifies a similar process in which oil is introduced at one end of the still and residue withdrawn from the other end. In this instance the division plates are placed transversely within the still, which is of the horizontal cylindrical type.

Treating hydrocarbon oils and similar materials. F. BERGIUS. U. S. 1,592,772, July 13 Heavy mineral oils or like materials may be formed into a paste with solids such as diatomaceous earth, coke powder or coal ashes (with or without an alk. desulfurizing reagent) and then treated with a hydrogenating gas in a reaction vessel heated by a jacket through which compressed CO_2 may be circulated as the heating medium. An app is described.

Separating hydrocarbon oils from water and other associated impurities. W. E. TRENT U. S 1,591,728, July 6. Hydrocarbon oil is commingled with finely divided coal or other like material to cause the oil and carbonaceous portion of the solid fuel to unite in a plastic "amalgam" while rejecting H_2O and other impurities. The oil may be distd from the "amalgam" or the latter may be used directly as a composite fuel.

Converting hydrocarbon oils with aluminum chloride. A. M. MCAFEE. U. S. 1,601,636, Sept. 28. Such a limited quantity of $AlCl_3$ and limited degree of heating are employed so as to produce a distillate at least as much of which b. 200–270° as b. below 200° In treating an oil such as gas oil, about 1.8% of $AlCl_3$ may be used in the treatment

Treating hydrocarbon oils with aluminum chloride. E. R. WOLCOTT. U. S. 1,601,421, Sept. 28. Oil under treatment is passed continuously through a series of pools and alternate pools are heated and cooled. $AlCl_3$ material is introduced into the cooled pools and vapors from the heated pools are removed and condensed. An app. is described.

Cracking and hydrogenating oils, coal, etc. INTERNATIONALE BERGIN-CIE VOOR OLIE EN KOLEN-CHEMIE. Brit. 242,876, April 27, 1925. In the production of benzine, petroleum" and like products by heating coal or heavy oils with H under pressure definite liquid level is maintained in the treatment chamber by taking off the gaseous, d and solid products together at a point between the top and bottom, and by submitting to pressure raw material such as a paste of powd. coal and oil or of liquid hydrocarbon material mixed with an absorbent such as coke, ashes, dolomite, alk. earth oxides and oil shale before it enters the treatment chamber. Cf. *C. A.* **19,** 169.

Cracking hydrocarbon oils. J. F. DONNELLY. Brit. 243,339, Nov. 21, 1924. Oil is heated to a cracking temp. under pressure to prevent vaporization while passing through a heated coil, and on discharge into a region of lower temp. is mixed with cooler oil to prevent decompn. with formation of tar and C. An app. is described.

Cracking hydrocarbon oils. W. F. FARAGHER, W. A. GRUSE and F. H. GARNER. U. S 1,601,730, Oct. 5. A horizontal drum cracking still is externally heated over its lower surface and gases are injected between the walls of the still and baffles spaced from the still walls so as to cause a circulation of the oil and prevent C deposition.

Destructively distilling and gasifying hydrocarbon materials. C. N. FORREST and H. P. HAYDEN. U. S. 1,568,018, Dec. 29, 1925. In effecting distn. and cracking of heavy hydrocarbon material, pieces of inert refractory material such as pumice or fire-brick fragments are used as a carrier and this porous material charged with the substances being treated is passed through a vertical retort where the materials are subjected to distg. temps. Near the exit, the material is subjected to a limited counterflow of air and steam so as to create in the reaction zones a region of combustion and a preceding region of cracking, thus eventually consuming the coke formed from the cracking and restoring the carrier material to clean, uncharged condition.

Decolorizing and stabilizing hydrocarbon oils. P. W. PRUTZMAN. U. S. reissue 16,439, Oct. 12. See original pat. no. 1,547,682, *C. A.* **19,** 3013.

Distilling and converting hydrocarbon oils. J. B. WEAVER. U. S. 1,601,786, Oct. 5. Vaporized oil is heated to above 535° and immediately after conversion in the vapor phase is effected the conversion products are rapidly cooled to a crit. temp. below 315°, above which crit. temp. the cooling will produce a deposit of substantially all the C that will be formed in the cooling. The C is collected for removal and the conversion products are further treated at a temp. sufficiently low that no further C deposition occurs. Fe_2O_3 may be used to assist conversion.

Hydrocarbon product. M. B. HOPKINS. Can. 264,192, Sept. 7, 1926. Hydrocarbon vapor is passed at atm. pressure with air through a temp. zone between 300° and 650° F., the proportion of air is between 5 and 20 cu. ft. per lb. of hydrocarbon. The products are collected and distd. with steam, treated with dil. alk. soln., and washed with water.

Hydrocarbon product. J. SIMPSON. Can. 274,193, Sept. 7, 1926. Petroleum distillates are prepd. by subjecting a naphtha distillate contg. S in corrosive form to the action of a Na plumbite soln. previously used to treat a sour cracked naphtha.

Purifying mineral oils. F. SCHWARZ. Brit. 242,317, May 9, 1924. "Turbine oil" may be mixed at a temp. of 25–30° with 1% of crude naphthenic acid, 1% of a 25% Na benzoate soln. and 1% of a 38° Bé. NaOH soln. and allowed to stand for a day. Generally, mineral oils may be freed from dark-colored substances by treating with soap and alkali, sepg. sludge by centrifuging or otherwise and finally washing with H_2O, salts such as benzoates, acetates, ethylsulfonates, phthalates, *m*- or *p*-aminobenzene sulfonates, α- or β-naphthalenesulfonates or chloride, sulfate or phosphate of Na, K or Mg may be added, and the oils may be preliminarily purified by treatment with reagents such as H_2SO_4 or fuller's earth.

Refining mineral oils with anhydrous antimony pentahalides. T. HELLTHALER. U. S. 1,601,753, Oct. 5. About 5% of $SbCl_5$ may be used with oils such as dark dynamo oil to produce a refined oil of light color.

Distilling petroleum oil. W. F. FARAGHER, W. A. GRUSE and F. H. GARNER. U. S. 1,601,729, Oct. 5. A body of oil in a still is heated externally below the cracking temp. and circulation of oil within the still is effected by upwardly directed gaseous currents such as natural gas which operate on the "air-lift" principle.

Decolorizing petroleum distillates. R. C. POLLOCK. U. S. 1,602,703, Oct. 12. Gasoline is agitated in the presence of 0.025–0.2 lb. of H_2SO_4 and 0.1–2.0 lbs. of clay for each bbl. of gasoline.

Dehydrating petroleum emulsions. H. C. EDDY and G. B. HANSON. U. S. 1,602,190, Oct. 5. A gas contg. a de-emulsifying agent is introduced into a well from which oil is being pumped.

Circulating system for dephlegmating partially cracked petroleum vapors. R. T. POLLOCK. U. S. 1,602,909, Oct. 12.

Distilling volatile substances from shale and similar materials. C. A. SPOTZ. U. S. 1,601,777, Oct. 5. Material to be distd. is passed below the surface of a bath of molten metal and the finer particles of material are then allowed to rise to the surface of the bath and are moved along the surface to be discharged with the spent submerged material. Volatile products are led off from the bath with exclusion of air.

Hydrogenation and production of non-sludging oils. H. R. MOODY. U. S. 1,601,406, Sept. 28. Sludge-forming oil such as a petroleum fraction contg. unsatd. compds. is treated with Al carbide and with $AlCl_3$, at an elevated temp. (usually about 120–150°). The treated oil is suitable for use in *elec. app.*

Tubular retort (with an internal heater) for distilling oil-shale, coal and other carbonaceous materials. J. J. JAKOWSKY. U. S. 1,602,819, Oct. 12.

Separating water from emulsified mineral oils. E. I. DYER and A. R. HEISE. U. S. reissue 15,871, July 15, 1924. See original pat. No. 1,242,784; *C. A.* **12,** 222.

Mineral oil contg. emulsified H_2O is passed under pressure through infusorial earth and the oil and H_2O are then permitted to stratify.

Filtration and sedimentation apparatus for separating oil and water. E. W. GREEN, H. OGDEN and G. R. UNTHANK. Brit. 243,501, Oct. 29, 1924.

Apparatus for gravity separation of oil and water. E. W. GREEN and H. OGDEN. Brit. 243,433, Aug. 26, 1924.

Hydrometer for testing gasoline at supply pumps, etc. T. O. BLAKE. Brit. 242,-770, Oct. 20, 1924. A density scale is provided which is adjustable to accord with temp. variations.

Decanting apparatus for gasoline purification. N. C. RILEY and R. B. GREEN. U. S. 1,602,705, Oct. 12.

Lubricant. P. C. MCKEE. U. S. 1,603,086, Oct. 12. A mixture of acetone 5 gals., celluloid "film scrap" 5 lbs., AmOAc 1/2 pint and graphite 5 lbs. is used on journal bearings, etc. Gold bronze may be added.

Lubricants for engine bearings or other machine parts. R. BIRKBECK, E. BIRKBECK and G. E WEBSTER. Brit 242,520, March 31, 1925. Lubricating oil is mixed with fat, Hg, S and castor oil, a suitable mixt. comprising, *e. g.*, lard 16 lbs., sheep tallow 1 lb , S 40 lbs , Hg 16 lbs and castor oil 24 lbs formed into a creamy compn., 4 oz. of which may then be added to 1 gal. of castor oil or other lubricating oil.

Refining mineral lubricating oil. J. W. WEIR. U. S. 1,603,174, Oct. 12. Lubricating oil stock is treated with H_2SO_4, settled and the major portion of the sludge is removed, then the oil is agitated with an absorbent such as fuller's earth at a temp. below that at which the sludge decomposes to gather the solid suspended sludge, the gathered sludge and absorbent material are then sepd. from the oil, additional absorbent material is added to the oil and the mixt is heated to a temp. sufficient to decompose the remaining sludge and liberate SO_2, and the solids are again sepd. from the oil.

Purifying waste lubricating oils. L. H. CLARK. Brit. 243,666, Nov. 29, 1924. Oils contg decompn. products, free fatty acids and colloidally suspended substances are heated with an aq. reagent such as Na silicate, NaOH, Na_3PO_4 or Na_2CO_3 and centrifuged.

Bituminous emulsions. G. S. HAY. Brit. 243,398, May 31, 1924. Asphalt is melted at a temp of about 102–107°, incorporated with starch or dextrin and a dil. soln. of KOH is added; boiling H_2O is added to bring the emulsion to the desired consistency and the mixt is agitated until emulsification is complete. Similar emulsions may be prepd for road making, as a binder for fuel briquets, for impregnating concrete, roofing or other purposes by the use of up to about 10% of starch or dextrin (which may be partly replaced by fatty acid) or an alkali starch gel as emulsifying agents. Cf. *C. A.* 20, 2067.

Treatment of bituminous substances. G. W. ACHESON. Can. 264,216, Sept. 7, 1926 A reflocculated solid adsorbent material and an acid reagent are caused to react on S-contg. bituminous substances

23—CELLULOSE AND PAPER

CARLETON E. CURRAN

The future trend of cellulose chemistry. G. J. ESSELEN, JR. *Ind. Eng. Chem.* 18, 1031–4(1926). E. J. C.

General study of the chemistry of cellulose and its principal derivatives. P. EHRMANN. *Thesis Strasbourg; Caoutchouc & gutta-percha* 23, 13,030–2, 13,064–5, 13,099–102, 13,138–9, 13,175–6, 13,240–1, 13,275–6(1926).—The subjects treated include the definition of cellulose, its occurrence, properties and formulas proposed for its constitution; hydracelluloses and hydrocelluloses; oxycelluloses; quant. methods for distinguishing modified celluloses; esters and ethers of cellulose; prepn. and properties of nitrocelluloses; cellulose sulfate; cellulose acetates and cellulose xanthates; with 123 references. C. C. DAVIS

Suggested constitutional formula for cellulose. H. LE B. GRAY. *Ind. Eng. Chem* 18, 811(1926) —Based on the empirical formula $[(C_6H_{10}O_5)_x]_y$, where x represents the simple mol. and y the aggregate bound by polymerization, G. proposes a formula consisting of 4 glucose residues, 3 contg. the amylene oxide ring and one the butylene. The OH adjacent to the latter should show different chem. properties than the other 24, confirming Herzog's x-ray analyses and phenomena exhibited by viscose, etc. The formula explains the formation of only 2,3,6-trimethylglucose from cellulose and of cellobiose octaacetate upon acetolysis. C. E. CURRAN

The manufacture of cellulose by means of electrolytic chlorine. C. MATIGNON. *Genie civil* **87,** 552(1925).—A description of the process applied at L'Electrochimica Pomilio at Naples. The alkalies and the Cl produced by the electrolysis of NaCl solns. are used to clean and bleach fiber plants obtained in Tunis and Algeria and enables paper stock to be produced. A market is thus obtained for excess plant intended for the manuf. of Cl during war times. JACK J. HINMAN, JR.

Heat problems in cellulose manufacture. G. SUNDBLAD. *Arch. Warmewirtschaft* **5,** 111–4(1924).—The sulfate and sulfite processes are described, and typical heat balances are given for an old and a modern plant of each type. ERNEST W. THIELE

Can trials in glass apparatus be used in the study of industrial processes? S. SCHMIDT-NIELSEN *Svensk Pappers-Tid.* **29,** 158–61, 186–8(1926).—Investigations of the mechanism of the reactions in the production of cellulose can be studied better and with more reliable results by working with 1-g. portions in glass vessels than by using semi-commercial amts. in technical app As evidence there are submitted 3 graphs and 9 tables of comparative numerical data covering 2 typical examples, the effect of the digesting liquor on the yield and quality of the fiber, and the effect of fillers on paper. W. SEGERBLOM

Investigations relating to the problem of the α-cellulose determination. H. BUBECK. *Papierfabr.* **24,** Festheft, 66–71(1926).—When pulp, mercerized in a 17.5% alkali soln., is dild. to 8–9% (by vol.), the max. amt. is dissolved. The α-cellulose of a pulp is regarded as that portion which, after a mercerization period of 30 min. in a 17% (by wt.) soln. of pure NaOH at 18°, is insol. in 8–9% (by vol) NaOH soln at room temp. (18–22°). A const. mercerization temp. is necessary, since this factor affects the α-cellulose value. Within 12–27° the α-cellulose increases with increasing temp. Brief differences in time are without influence. A 90 min. mercerization of a series of pulps showed a max. difference of only 0.36%, compared with the values obtained by a 30-min. period. J. L. PARSONS

The action of oxygen on alkali cellulose. W. WELTZIEN AND GERHARD. *Papierfabr.* **24,** Tech.-Wiss. Teil, 413–4(1926).—Cotton or artificial silk swollen by NaOH absorbs O in large quantities at ordinary temp. The absorption increases with temp. elevation. Bleached cotton, mercerized with 10% NaOH soln. and pressed until its wt. was approx. 3 times the wt. of the untreated material, was placed in an app. filled with gaseous O and heated in a thermostat to 60°. The rate of absorption was nearly const. even after 41 days; the end-point of the reaction was not detd. J. L. P.

Soluble cellulose esters of the higher fatty acids. H. GAULT AND P. EHRMANN. *Bull. soc. chim.* **39,** 873–83(1926).—The chlorides of lauric, palmitic and stearic acids acting upon hydrocellulose "Girard" in the presence of pyridine and toluene gave, resp., *cellulose laurate, palmitate* and *stearate* as insol. monoesters and at the same time the sol *dilaurate, dipalmitate* and *distearate* of cellulose in soln. The latter esters treated with excess of the acid chlorides gave, resp., *cellulose trilaurate, tripalmitate* and *tristearate* By using nitrocellulose and the acid chlorides, *laurodinitrocellulose* and *palmitodinitrocellulose* were prepd.; cellulose acetate was used instead of nitrocellulose. *Laurodiacetocellulose* and *palmitodiacetocellulose* were obtained similarly. The complete soly. of these esters in aromatic hydrocarbons is a characteristic property. R. C. ROBERTS

The determination of the degree of swelling of cellulose by the Schwalbe hydrolysis-number method. G. BERNARDY. *Z. angew. Chem.* **39,** 259–61(1926).—The Schwalbe hydrolysis no. method for detg. the amt. of swelling has given very unsatisfactory results to several investigators The method is to hydrolyze the finely cut cellulose exactly 15 min. with boiling 5% H_2SO_4, neutralize with 40% NaOH, add Fehling soln., again boil exactly 15 min., collect the Cu_2O, dissolve in HNO_3 and det. electrolytically. B. shows that the errors and variations are due to inexact neutralization of the acid and describes a slight modification of the app. to obviate this. M. A. Y.

Esparto grass. L. PAOLI. *Papierfabr.* **24,** Festheft, 110–1(1926).—Esparto grass cultivation in northern Africa is described and the paper-making qualities of the fiber are discussed. J. L. PARSONS

For the organization of the scientific investigation of plant fibers. C. G. SCHWALBE *Kolloid-Z.* **39,** 178–80(1926).—Fresh fibers are rarely used for examn. No account is taken of the "living age" of fibers or the aging which may have occurred after their death. Both chem. and colloidal changes occur on aging. The Am. Chem. Soc. has a commission to investigate standard cellulose. Only such standard materials should be used in investigation. F. E. BROWN

The aging of plant fibers. C. G. SCHWALBE. *Papierfabr.* **24,** Festheft, 38–41 (1926).—The aging of plant fibers may be divided into 2 periods: the age of the living fiber, and the duration of storage on the fiber after the vitality of the protoplasm has

ceased. Very young fibers are soft, pliant and capable of being highly swollen; old fibers become stiff and brittle. Prolonged drying of pulp wood produces a contraction of the cell membranes and decreases the absorption of the cooking liquor. Wood chips after being stored for 10 years could not be cooked by the sulfite process. Wood which has been deresinified and dehydrated with C_6H_6 is practically incapable of digestion by the sulfite process: the extn. has destroyed the swelling property of the fibers. For this reason fresh wood is preferred to stored wood for mech. pulp. The latter is preferable, however, for steamed mech. pulp. The drier the wood, the more rapid and uniform will be the action of the steam. Aging affects the chem. and phys. reactivity of wood fibers to a much greater degree than fibers free from such incrustations. The oven drying of fibers is more harmful than careful air drying. Fiber durability depends on the quality of the raw material, as well as on other factors, such as sizing, etc. The addn. of hygroscopic substances retards the aging of fibers. J. L. PARSONS

Investigations on the chemistry of the sulfite pulp process. ERIK HÄGGLUND. *Svensk Kem. Tids.* **28,** 177–92; *Papierfabr.* **24,** Tech.-Wiss. Teil, 449–50, 483–8(1926); cf. *C. A.* **20,** 821.—Evidence is given to show that during the early part of the sulfite cooking process the lignin is sulfonated but remains as an insol. compd. By subsequent hydrolysis the greater portion of this compd. is rendered water sol. "Overcooking" is apparently a condition which causes an intramol. change to form an insol. and dark colored compd. In unbleached sulfite pulp, lignin is present as the insol. lignosulfonic acid, to which compd. is attributed the fluorescence effect observed after exposure to ultra-violet light. H-ion concn. in sulfite liquor was detd. satisfactorily by obtaining the reaction const. for the inversion of sucrose soln. and then comparing with reaction data obtained by treating similar sugar solns with HCl solns of known H-ion concns. For Ca, Mg and NH_4 sulfite cooking liquors, the p_H in actual cooking operations increased from 1.9 to 2.0 after 6 hrs , and decreased after 12 hrs., dropping to 1.7–1.8 after 18 hrs. The initial decrease in acidity was due to the moisture in the wood. Expts. with these 3 cooking liquors showed that the free SO_2 increased slightly; the amt. of bisulfite gradually decreased; the loosely fixed SO_2 increased proportionately with the amt. of lignosulfonic acid in soln.; the sugar and pulp yields were about the same. The Cu nos. of the pulp were in general higher at the beginning than at the end of the cook; the Br nos. were identical for the Ca and Mg liquors, but higher for the NH_4 liquor. The properties of the resulting pulps are shown graphically. J. L. P.

The inventor of sulfite pulp. JOHN LUND. *Paper Making* **45,** 313–4(1926).—Brief historical notes on the work carried out at Northfleet by C. D. Ekman on the sulfite process. A. PAPINEAU-COUTURE

Economical use of (waste) sulfite liquor. A. W. ALLEN. *Chem. Met. Eng.* **32,** 928–31(1925).—The application of the Peebles evaporator to waste sulfite liquor and use of the concd. liquor for boiler fuel is described. C. E. CURRAN

Modern control system in producing sulfate pulp. O. HEIJNE. *Svensk Pappers-Tid* **29,** 249–57(1926) —Comparison of American and Scandinavian sulfate pulping practice with data relative to methods of control. W. SEGERBLOM

Modern control system in producing sulfate pulp. E. OMAN. *Svensk Pappers-Tid.* **29,** 286(1926).—E., referring to the paper by Heijne (preceding abstr.) points out that methyl orange is an unsuitable indicator because of its indistinct color change and small sensitivity, also that phenolphthalein is unsuitable due to the presence of Na_2S in the soln. E. considers the use of both indicators in the same soln. as of doubtful value. He also objects to pptg. the carbonate without filtering off the $BaCO_3$. He recommends Nile blue (sulfate) for NaOH and Na_2S, thymol blue for NaOH, Na_2S, and Na_2CO_3, and bromophenol blue for NaOH, Na_2S, Na_2CO_3 and Na_2SO_4. W. S.

Modern control system in producing sulfate pulp. O. HEIJNE. *Svensk Pappers-Tid.* **29,** 340(1926).—Answering Oman's criticism (preceding abstr.) H. does not deny that the indicators suggested by O. give more accurate results but contends that methyl orange and phenolphthalein are widely used in the sulfate pulp industry and that it is better to employ generally adopted and widely used methods giving approx. results than to use a more accurate analytical method which few employ. W. SEGERBLOM

A semi-chemical pulping process. J. D. RUE, S. D. WELLS, F. G. RAWLING AND J. A. STAIDL. *Paper Mill* **49,** No. 38, 10, 12, 39–40(1926); *Paper Trade J.* **83,** No. 13, 50–3(1926); *Pulp Paper Mag. Can.* **24,** 1163–7(1926).—The process consists essentially in: (1) a pressure impregnation of the chips with the cooking liquor; (2) a mild digestion of chips with chemicals which are practically neutral and which are capable of maintaining neutrality during the liberation from the wood of considerable quantities of org acids (preferably a soln. contg. about 10 lbs. Na_2SO_3 and 4 lbs. $NaHCO_3$, calcd. as Na_2CO_3, per 100 lbs. of wood); (3) a mech. reduction of the softened chips to pulp, prefer-

ably in a rod mill. Cooking data and strength data of the papers produced are tabulated for hardwood pulps designed for print papers, hardwood pulps designed for boards, and coniferous pulps. Coniferous woods yield readily to the treatment, but the pulp does not possess strength and flexibility commensurate with the length of the fibers and it is not considered the process would be economically or technically advantageous for the reduction of these woods. The pulps obtained from deciduous woods possess much greater strength and flexibility than soda pulps from the same woods. Paper of the wt. and caliber of news print made wholly from semi-chem. pulp of black, tupelo, or red gum, or aspen, birch or maple possesses greater strength than the present com. news print. With addn. of clay excellent catalog paper can be made. The process is suitable for the manuf. of board pulp, and in such case the wood requires much less care ful prepn. than for print paper. Production of board from extd. chestnut chips by the semi-chem. process has satisfactorily passed into the com. stage of manuf. The economic advantages of the process are discussed. A. PAPINEAU-COUTURE

The hardness of sulfite pulp. D. A. CAMERON AND M. W. PHELPS. *Pulp Paper Mag. Can.* **24,** 1170 2(1926).—Residual lignin plays an important part in detg. the quality of sulfite fiber. This lignin is readily approximated with sufficient accuracy for works control by the use of a $KMnO_4$ test (see Cadigan, *C. A.* **18,** 1905), which could be applied for controlling the time of blowing the cook to obtain the desired "hardness" of pulp. Com. pulps have a hardness no. of 10–20 and a lignin content of 3–5%. Future cooking methods may be developed to eliminate less lignin, increasing residual lignin to over 10% and giving yields of 55–65%. Hardness tests would facilitate the detn of the exact blowing time that such cooking conditions would require. A. P.-C.

Sulfite pulp and its uses. HAROLD HIBBERT. *Dyer & Calico Printer* **56,** 29(1926).—A chart showing the uses of wood pulp. CHAS. E. MULLIN

Freeness of sulfite pulp. D. S. DAVIS. *Ind. Eng Chem.* **18,** 631–3(1926).—Using a Williams freeness tester, D has developed a method for duplicating orifice settings and converting values obtained with one orifice in terms of another. Charts are also given for converting freeness values from one consistency to another and adapting the Williams app. to detn. of additive freeness C. E. CURRAN

The fluorescence of sulfite pulps. C. WALTER LEUPOLD. *Papierfabr.* **24,** Tech.-Wiss. Teil, 397–8(1926).—The fluorescence of waste sulfite liquor or sulfite pulp under the action of sunlight, or other light sources rich in ultra-violet rays, is attributed not to lignin decompn. products, but rather is an optical phenomenon due to S compds. which are diffused as lipoid-insol. substances in the fiber cells. J. L. PARSONS

The violet fluorescence of sulfite pulp and waste sulfite liquors. OTTO GERNGROSS AND KINGNOR TSOU. *Papierfabr.* **24,** Tech.-Wiss. Teil, 497–9(1926).—The results of Kirmreuther, Schlumberger and Nippe (cf. *C. A.* **20,** 2746) on the violet fluorescence of waste sulfite liquors have been confirmed. The cause of this phenomenon is not due to a lignosulfonic acid or to any compd. produced during the digestion process, but is attributed to a natural substance in the spruce bark and wood, where it is more firmly combined. The latter is responsible for the fluorescence of unbleached sulfite pulps. J. L. PARSONS

The influence of a shortened preliminary cooking time on the nature of sulfite pulp. O. ROUTALA AND J. SEVÓN. *Zellstoff u. Papier* **6,** 257–9(1926).—Results of cooking expts. when the temp. and pressure are brought to 100° and 4 atm. within the first hr. of the digestion process indicate that the resulting sulfite pulp has not been changed. The reason for the lack of uniformity during the cooking process is not entirely due to imperfect penetration of the wood by the liquor before 100° is reached, but more often to a too rapid increase of the temp. from 100° to 130–140°, during which period the incrustations dissolve most rapidly. J. L. PARSONS

The possibility of utilizing Finnish sulfite waste liquor by means of yeast organisms. VÄINO KROHN. *Ann. Acad. Sci. Fennicae A.* **23,** No. 8, 3–147(1926).—Increased alc. yields are possible from sulfite waste liquor by proper prepn. of the liquor and cultivation of strains of yeast organisms resistant to the modified liquor, together with careful control of the fermentation process. Sulfite waste liquor contains yeast-poisoning materials (SO_2, formic acid, etc.), but the carbohydrate content is high. K, Mg, Ca and SO_4 are present in considerable amts. N and PO_4 are practically absent. A suitable nutrient medium can be secured from the waste liquor either (1) by removal of the injurious components through boiling, aeration and neutralization with lime, or boiling with sawdust, addn. of $CaCO_3$, and aeration to attain the proper acidity, or (2) by addn. of suitable nutrients to the liquor. In either case objective cultivation of yeasts adapted to such media is required as neither wild nor cultivated forms will work satisfactorily until after such adaptation. To obtain the best results with trained yeasts such factors

as the acidity, temp., N source, addn. of O, balance of nutrients, etc., must be very carefully controlled. LOUIS E. FLECK

Indicators for the pulp industry. E. OMAN. *Svensk Pappers-Tid.* Nos. 9–11 (1925); *Papierfabr.* **24**, Tech.-Wiss. Teil, 267–70, 285–8, 299–303(1926).—Cf. *C. A.* **19**, 2743. J. L. PARSONS

The control of stock concentration. H. SCHWALBE. *Wochbl. Papierfabr.* **57**, Sondernummer, 70–2(1926).—The Herdey centrifugal method of detg. stock concn. is modified by using 100-cc. glass containers in the centrifuge, filling to the 80-cc. mark with stock and the remaining 20 cc. with "glanz" oil (contg. 50% Turkey red oil), which acts as an antifoam agent. The glasses are whirled for 4 min. at 2000 revolutions per min. The height of the pulp residue is a measure of the stock concn. J. L. P.

The phloroglucinol reaction with incompletely cooked sulfite pulp. KORN. *Papierfabr.* **24**, Tech.-Wiss. Teil, 521–2(1926).—The following conclusions are drawn as a result of many tests on different sulfite pulps with phloroglucinol reagent: (1) the degree of lignification can be estd macroscopically in small samples, both in the original condition and after a 15 min. treatment with 1% NaOH soln., when treated with phloroglucinol and HCl. The greater the difference in the red coloration, the less has the pulp been cooked. (2) In the testing of paper for groundwood with phloroglucinol, the appearance of an intense red color may be due to incompletely digested pulp, even if the sample has been previously treated with NaOH, or hot water; a microscopic test will indicate with certainty the presence of groundwood. J. L. PARSONS

The bleaching of sulfite pulp. L. RYS. *Papierfabr.* **24**, Tech.-Wiss. Teil, 529–33 (1926).—During the bleaching of sulfite pulp with hypochlorite solns. a chlorination occurs and the final reaction products are sol. Whether chlorination occurs during the initial bleaching stage was not detd. Under otherwise similar conditions, the amt. of org fixed Cl increases with the lignin content of the bleached pulp. Expts. showed that the equation $2NaOH + Cl_2 \rightleftharpoons NaClO + NaCl + H_2O$ is reversible, and that chlorination was characterized by a displacement of the equil. to the left, and oxidation to the right. It is probable that the bleach soln. tends to become neutral during the reaction. The pulp color was inferior in the presence of Cl_2 or chlorides. Resinification of the lignin occurs with intense chlorination without oxidation. J. L. PARSONS

Developments in the bleaching of pulps. H. WENZL. *Wochbl. Papierfabr.* **57**, 955–60(1926).—High density bleaching devices are discussed, with especial reference to the Wolf and Thorne systems. A patented process is briefly described which consists in increasing the production of the older type bleachers by chem. means and thereby economizing on power, steam and time. It may be made a continuous system. Comparative bleaching tests, with and without the addn. of "Greloxin" to the usual bleach bath at 38°, showed that the time can be reduced from 10 to 2 hrs. At 23° the time was about 4 hrs. when "Greloxin" was added. The quality of the pulp bleached by the accelerated process was superior: the Cu no. was 50% lower than that of pulp bleached by the usual procedure. J. L. PARSONS

The Thorne pulp-bleaching process. JULIUS FUNCKE. *Papier* **29**, 533–7(1926); *Paper Trade J.* **83**, No. 3, 49–51(1926); *Paper Ind.* **8**, 1001–2(1926).—See *C. A.* **20**, 2748. A. PAPINEAU-COUTURE

High density bleaching. HANS WREDE. *Paper Maker and Brit. Paper Trade J.* **Annual No.,** 57(1926).—Brief discussion of the merits of the Wolf high-d. bleacher. A. PAPINEAU-COUTURE

Bleaching apparatus and the bleaching of pulp at high stock concentrations. HANS WREDE. *Papierfabr.* **24**, Tech.-Wiss. Teil, 421–7(1926); *Wochbl. Papierfabr.* **57**, 903–9 (1926).—High-density bleaching of pulp is briefly discussed. The different types of Wolf high-density bleachers, as manufactured by Voith, are described. J. L. P.

A rapid tester for the available chlorine in hypochlorite solutions and chlorine bleach baths. H. WENZL. *Papierfabr.* **24**, Tech.-Wiss. Teil, 406–7(1926).—A portable, rapid volumetric tester is described for detg. the available Cl in bleach solns. by the addn. of H_2O_2. J. L. PARSONS

Whiteness measurements on bleached pulp samples. H. WENZL. *Papierfabr.* **24**, Tech.-Wiss. Teil, 409–10(1926).—In the detn. of the whiteness content of bleached pulps by the Ostwald penumbral photometer, the following rules should be observed: (1) Only air-dry samples should be employed. (2) The wt. of the pulp must be over 400 g per sq. m., thinner samples are translucent. (3) The pulp must have a smooth surface, as felt marks affect the accuracy of the readings. Highly compressed pulps should be moistened, smoothed and carefully dried before placing in the photometer. In the estn of whiteness, a sepn. of the yellow and red shadings is necessary, and for this

purpose 3 color filters, which are standardized spectroscopically and possess a definite absorption spectrum, should be used. J. L. Parsons

A new Swedish discovery in the sulfate industry. C. G. Schwalbe. *Papierfabr.* **24,** Tech.-Wiss. Teil, 515-6(1926).—A discussion of the Nordstrom process for the utilization and the deodorizing of waste gases from sulfate pulp mills. J. L. P.

Soda pulp investigations. I. Yield and quality of pulp as affected by length of chip. D. E. Cable, R. H. McKee and R. H. Simmons. *Paper Trade J.* **83,** No. 14, 47-9(1926); cf. *C. A.* **20,** 1517.—With chips varying in length with the grain from 0.5 to 1.25 in., no appreciable differences in yield, bleach consumption or loss on bleaching could be detected in the case of aspen, white birch, white maple and silver maple This apparently holds regardless of whether the total duration of a cook is that commonly used in mill practice or only slightly longer than the min. time possible for achieving full pulping action on the chips. The av. yields of soda pulp under standard conditions for aspen, white birch and white maple were 48.2, 46.4 and 45.0%, resp., equiv. to 1176, 1895 and 2051 lbs. per cord, resp., showing that these hardwoods give 55 to 75% higher yields than aspen on a cord basis Silver maple cooked 4.5 hrs. appears to give the same yield as when cooked 6 hrs , yields in either case being approx. the same on percentage basis as yields from white maple cooked for 6.5-7 hrs. The bleach (calcd. to 35% available Cl) requirement and loss on bleaching for the pulps studied averaged: aspen 8.3, 1.5; white birch 12.9, 2.3; white maple 13.5, 2.6; silver maple 13.3, 2.2%, resp. A Papineau-Couture

The cooking of pine wood by the sulfite process. C. G. Schwalbe and Kurt Berndt. *Wochbl. Papierfabr.* **57,** Sondernummer, 27-37(1926).—Pine wood cooked by the sulfite process; with Ca or Mg bisulfite cooking liquors, gives a hard, brittle, brownish red pulp. During the digestion period (10 hrs) the pressure rapidly increased to a max. of 5 atm at 133-134°. When org solvents, such as C_6H_6 and Et_2O, are employed to remove the fats and resins in a preliminary extn. of pine wood it is not possible to produce a satisfactory pulp under the usual cooking conditions. By extending the time a good pulp might be obtained. An alk. pretreatment of pine wood, with dil. solns. of either NaOH or Na_2CO_3, gave a 55% yield of a very hard pulp contg. a relatively large amt. of incrustations. The fibers were not as brittle as with the solvent-extd. wood. Preliminary treatments with alkali and then C_6H_6 yielded a poor pulp. Treatment of pine wood with C_6H_6 profoundly affects the properties of the raw material. Pretreatment with 1% AcOH yielded a carbonized pulp. The digestion of the heartwood by the acid process remains an unsolved problem It is not known with certainty that the higher resin and fat content is the real difficulty. J. L. Parsons

The fiber length of sulfite pulps. E. Richter. *Wochbl. Papierfabr.* **57,** 798-9 (1926).—The detn. of fiber length is a valuable test for evaluating the quality of a sulfite pulp. Microscopical detns of the av. length of incompletely cooked fibers amounted to 2.31-2.51 mm., depending on the nature of the wood and pulp. The av. length of all fibers was 1.26-1.72 mm. Fiber length is influenced by the digestion process, but does not vary greatly with the lignin content of the pulp nor the moisture in the wood. J. L. Parsons

Calculation of the water consumption for a sulfite and wrapping-paper mill. A. St. Klein. *Wochbl. Papierfabr.* **57,** Sondernummer, 56(1926).—For a mill producing 35 kg. sulfite pulp and 7 kg. paper per min., the av. water consumption is calcd. to be 12,000 l. per min. J. L. Parsons

The rod mill in the pulp and paper industry. J. D. Rue and S. D. Wells. *Paper Trade J.* **83,** No. 12, 53-4(1926); *Paper Mill* **49,** No. 38, 14, 16(1926).—Expts. conducted for 2 yrs. on a semi-com. rod mill (3 ft. internal diam. by 5 ft. long, charged with 3800 lbs. of steel rods) have proved it to be an excellent means of reducing to fiber wood chips, cereal straw and flax straw, after the material has been softened by mild chem. treatment; it has also been used successfully in reducing knots and screenings resulting from the chem. pulping processes. In can also serve as a continuous beater which effects hydration without excessive rupture of the fibers. A. Papineau-Couture

Italian celluloid industry. Vittore Ravizza. *Giorn. chim. ind. applicata* **7,** 576-80 (1926).—Descriptive, with a number of photographs. Robert S. Posmontier

Rapid analysis of raw materials used in the manufacture of celluloid. Bellanger. *Rev. gén. mat. plastiques* **2,** 368-72(1926).—Brief outline of the testing of cellulose (both cotton and paper), acids, camphor, alc., celluloid waste, camphor substitutes, plastifiers, urea and solvents, from the standpoint of the requirements for celluloid manuf. A. Papineau-Couture

Cellophane. Anon. *Wochbl. Papierfabr.* **57,** 998-9(1926).—Brief description of the mfg. process. J. L. Parsons

International pulp and paper statistics. H. G. HAGSTRÖM. *Svensk Pappers-Tid.* **29,** 279–80(1926).—Continuation of the data given in *C. A.* **17,** 3787; **18,** 2427.
W. SEGERBLOM

Recent developments in pulp and paper manufacture in America. WALTER BRECHT. *Wochbl. Papierfabr.* **57,** 584–8, 707–9, 827–9, 909–11, 961–3(1926).—The conclusion of a series of articles on American practice in pulp manuf., beating, process control, bleaching and stock regulators.
J. L. PARSONS

Woods from Nigeria as paper-making materials. ANON. *Bull. Imp. Inst* **24,** 8–14(1926).—Analyses of (1) Abura (*Mitragyna macrophylla*), (2) Afara (*Terminalia superba*), (3) Oro (*Irvingia barteri*), (4) Arere (*Triplochiton nigericum*) and Ogia (*Daniella ogea*) (two planks of somewhat different appearance and analyzed separately) are given together with the results of pulping tests. In every case bleaching was difficult, required a large bleach consumption and did not give a very good white. A. P.-C.

Paper-making qualities of water-hyacinth (Eichhornia crassipes). L. VIDAL AND M. ARIBERT. *Agronomie coloniale* **13,** 252(1925); *Bull. Imp. Inst.* **24,** 267–8(1926).—"Luc-Binh" leaves from Indo-China contained H_2O 5, ash 5, cellulose (on dry basis) 32%. The pulp obtained by digestion with NaOH consists of flat, transparent, thin-walled fibers, 2–3 mm. long, and 0.012–0.030 mm. in diam. Pulping with CaO gave 35% of unbleachable pulp which could be converted into brown wrapping paper of fair quality, but the yield is only about half that given by straw. Digestion with NaOH gave 27% of pulp which could be bleached only with difficulty; and the paper obtained from this pulp is lacking in strength and of inferior quality. A. PAPINEAU-COUTURE

Bamboos from Malaya for paper making. ANON. *Bull. Imp. Inst.* **24,** 219–21 (1926).—Samples of "Buloh Plang" (probably *Gigantachloa wrayi,* Gamble) and of "Buloh Kasap" (*Ochlandra ridleyi,* Gamble) had: H_2O 11.1, 9.8; ash 3.5, 4.2; cellulose (on dry basis) 56.25, 55.1%; ultimate fiber length, max. 3.6, 4.2, min. 1.4, 1.0, av. 2.4, 2.3 mm., resp. On cooking 7 hrs. at 160° with 20 parts NaOH at a concn. of 4%, the two samples gave 41 and 39% of well-reduced unbleached pulp, with consumptions of 11.5 and 11.9% NaOH, on the wt. of stems used, and the corresponding yields of bleached pulp were 36 and 35%. The pulp from Buloh Plang furnished a strong light-brown paper; it bleached fairly readily to a pale-cream color and the bleached pulp yielded an opaque paper of good strength and quality. Buloh Kasap pulp furnished a strong, rather paler paper; it bleached readily, yielding a white opaque paper of good strength and quality. Both materials are considered suitable for the com. production of high-quality pulp. A. PAPINEAU-COUTURE

Doum palm (Hyphaene thebaica, Mart.) (as a paper-making material). F. HEIM DE BALSAC, M. CERCELET, J. MAHEU, G. S. DAGAND AND R. HEIM DE BALSAC. *Bull. agence gén. colonies* **18,** 1038(1925); *Bull. Imp. Inst.* **24,** 264–5(1926).—Paper-making tests were made with the wood and with the leaf (both petiole and lamina) of palms from the Goundam and Issa-ber districts of the French Soudan. Analysis calcd. to the dry basis of the wood (H_2O 11.09%) and of the lamina (H_2O 10.75%) gave: ash 1.21, 17.63; fats and waxes 1.05, 0.76; cellulose 48.80, 27.70; lignin 48.94, 53.91%, resp. On digestion with NaOH under pressure, the wood furnished a dark-brown pulp and the leaves (petioles and lamina) a pulp of lighter tint, both of which bleached fairly easily with 35 and 27% yields, resp., expressed on the dry raw material. The pulp in each case was composed of cylindrical, regularly tapering fibers, with a lumen of variable size. The wood fibers were 0.8–1.5 mm. long, av. 1.0, and had a diam. of 0.025–0.045 mm., av. 0.030. The leaf fibers were 0.8–2.0 mm. long, av. 1.5, and had a diam. of 0.010–0.025 mm., av. 0.015. The paper made from the pulp obtained from the wood was of inferior quality, while that from the leaves was of good quality, but the yield in the latter case was low. A. PAPINEAU-COUTURE

"Matsia" grass (Sporobolus pyramidalis, Beauv.) (as a paper-making material). F. HEIM DE BALSAC, M. CERCELET, J. MAHEU, G. S. DAGAND AND R. HEIM DE B[illegible] *Bull. agence gén. colonies* **18,** 1244(1925); [illegible]
; from Mada[illegible]

Madagascar palms (as paper-making materials). F. Heim de Balsac, M. Chercelet, J. Maheu, G. S. Dagand and R. Heim de Balsac. *Bull. agence gén. colonies* **19,** 23(1926); *Bull. Imp. Inst.* **24,** 266–7(1926).—Sep. investigation of the stem, petiole and lamina of "Satrabe" (*Medemia nobilis,* Hild. and W. Drude) and of "Satramira" (*Hyphaene Schatan,* Boj.) gave the following results (analytical results are on dry basis, except H_2O; pulping was carried out with NaOH soln. under pressure, but the cooking conditions are not specified):

	Satrabe			Satramira		
	Stem	Petiole	Lamina	Stem	Petiole	Lamina
H_2O %	7 84	9 36	9 05	8 19	10 23	9 42
Ash %	5 30	6 84	7 00	5 83	6 22	6 43
Fats and waxes	1 00	0 70	0 64	1 10	0 96	0.72
Cellulose %	79 15	75 40	66 20	68 32	70 08	60.00
Fiber-length (mm):						
Minimum	0.8	0 8	0 5	1 0	0 5	1.0
Maximum	1.4	2 5	2 3	2.25	2 0	3 5
Average	1.0	1.7	1 5	1 7	1 4	2 0
Fiber-diam. (mm.):						
Minimum	0 025	0 010	0 010	0.020	0 010	0 010
Maximum	0 050	0 020	0 020	0 035	0 020	0 020
Average	0 040	0 015	0 015	0 030	0 015	0 015
Felting power	0 04	0 009	0 010	0 018	0 011	0 008
Yield of bleached pulp %	31	26	22	29	28	22

The pulp from Satrabe stem furnished a paper of inferior quality which could be used only as a filler; the two parts of the leaf gave papers of good quality and, in spite of the low yield, would be of definite interest for paper making. Each of the 3 parts of Satramira gave a pulp which furnished paper of an av. quality; the yield is rather low in the case of the lamina, but the whole plant would be of interest as a raw material for paper making. A. Papineau-Couture

Banana paper. T. Reifegerste. *Wochbl. Papierfabr.* **57,** Sondernummer, 73–5 (1926).—Paper made from waste from the banana tree (*Musa sapientum* L.), such as leaves and stems, is very strong and is more or less impervious to water without a sizing treatment. The sheet is dark brown in color and is used as a substitute for kraft paper. The use of 2% Na_2CO_3 instead of 5% NaOH in the digestion process gives a less pure pulp but a higher yield. Bleaching is done with a 5% $Ca(OCl)_2$ soln., calcd. on the wt. of the pulp. Cost figures for the process are tabulated. J. L. Parsons

India paper. James Scott. *Paper Maker & Brit. Paper Trade J.* **Annual No.,** 65–71(1926); *Pulp Paper Mag Can.* **24,** 1061–4(1926).—Description of its origin, history and compn. A. Papineau-Couture

Anti-falsification paper. James Scott. *Paper Maker & Brit. Paper Trade J.* **Annual No.,** 75–7(1926).—Various formulas are given suitable for making so-called safety papers, which immediately show up any attempt to tamper with what has been written or printed on documents. A. Papineau-Couture

Parchment paper and its manufacture. Maurice de Keghel. *Paper Trade J.* **83,** No. 10, 57–62(1926).—See *C. A.* **20,** 1519. A. Papineau-Couture

Preparation of electric insulating materials from hardened impregnated papers. L. Bouvier. *Rev. gén. mat. plastiques* **2,** 383–7(1926); *Paper Trade J.* **83,** No. 9, 51–4 (1926).—See Micksch, *C. A.* **20,** 289. A. Papineau-Couture

Coated paper. M. L. Griffin. *Paper Mill* **49,** No. 36, 2, 43–8; No. 37, 2, 10–20, 38–40(1926).—A detailed discussion of the properties and use of the various raw materials used and of the method of carrying out the coating operation. A. P.-C.

The chemical pretreatment of industrial water. Drechsler. *Papierfabr.* **24,** Tech.-Wiss. Teil, 309–10(1926).—The chem. treatment of water with $Al_2(SO_4)_3$ is described, with especial reference to paper manuf. J. L. Parsons

Asbestine. H. Postl. *Papierfabr.* **24,** Tech.-Wiss. Teil, 398–402(1926).—The mining, refining and applications of *asbestos* and asbestine in the paper industry are discussed. J. L. Parsons

Developments in straw board manufacture. F. J. J. Driesens. *Wochbl. Papierfabr.* **57,** 681–4, 736–9(1926).—A general discussion. J. L. Parsons

Modernizing a boxboard mill. H. G. Ingraham. *Chem. Met. Eng.* **32,** 782–7 (1925).—Descriptive of the boxboard mill of the National Paper Products Co., Stockton, Cal. C. E. Curran

Recent results on the strength determination of paper pulps. HELLMUTH SCHWALBE. *Papierfabr.* **24,** Tech.-Wiss. Teil, 465–8, 481–3(1926).—Chiefly a discussion of the results of Ruhlemann, Cameron, Miller, von Posanner and others on the strength detn. of pulps. A list of 21 references is appended. J. L. PARSONS

The bursting strength tester. KARL FENCHEL. *Papierfabr.* **24,** Tech.-Wiss. Teil, 294–5(1926).—To obtain comparative values for the bursting strength of papers of different wts., F. calcs. the strength, using the Mullen tester, referred to a basis wt. of 100 g. per sq. m. These figures are "relative" in comparison to the "abs." ones given directly by the tester. In the operation of the Mullen tester, the glycerol must extend to the rubber membrane, otherwise high values will result. The membrane stretches on use, and should be renewed every 2 months. J. L. PARSONS

Determination of the degree of sizing of paper. U. ALBRECHT. *Pappers-Och Travarutidskrift for Finland,* May 31, **1925;** *Pulp Paper Mag. Can.* **24,** 1065(1926).—The device consists essentially of 2 glass bulbs connected by means of a large tube and arranged so as to rotate about a horizontal axis. One of the bulbs is provided with an orifice from which a large glass tube leads into the interior of the bulb. Before a test is made the latter bulb is upwards, and the lower bulb is partially filled with ink. The test sheet is clamped over the orifice, the app. is rotated through 180°, and the time taken for penetration of the ink through the paper is noted with a stop watch, the paper being observed by means of a mirror under the bulbs A PAPINEAU-COUTURE

The filling and sizing of paper. H. ROSCHIER. *Papierfabr.* **24,** Tech.-Wiss. Teil, 348–50, 363–5, 384–8(1926).—Recent theories concerning the use of fillers and sizing agents in paper are reviewed. Tests show that paper fillers are retained partly mechanically by filtration and partly as a result of the pptn. of the rosin and $Al(OH)_3$. H-ion concn. has considerable influence on filler retention, which is rapidly increased as the p_H is varied from 4 to 5.6. The retention is const. from 5.6 to 7. Adsorption phenomena play a secondary role with fillers. Retention, with both unsized and sized papers, increases with the increase in particle size. The necessity for standardizing fillers according to their degree of dispersions is emphasized. J. L. PARSONS

Aluminum resinate in the rosin sizing of paper. E. OMAN. *Papierfabr.* **24,** Tech. Wiss. Teil, 410–3, 451–5(1926).—A portion of the literature on the rosin sizing of paper is reviewed. The Al in the sizing bath acts as a mordant for the free rosin. The acid no. of rosin (g. NaOH required by 100 g. rosin) usually is 11–12. Al resinate was prepd. by adding K alum in excess to a clear soln. of rosin in NaOH. The ppt. was washed and dried at room temp Its ash content was 4.76%. The ppt was sol. in Et_2O, C_6H_6, CCl_4, but not in Et_2O-EtOH. The prepn probably was a basic Al resinate mixed with free rosin acids. On heating, the air-dried material became darker as the temp. increased, and the % of free rosin acids in the Et_2O ext. decreased. J. L. PARSONS

The influence of glue top-sizing on the properties of rosin and starch-sized papers. E MUNDS *Wochbl. Papierfabr.* **57,** 883–7(1926) —The properties of paper, previously sized with rosin and starch, are enhanced by a surface sizing with glue. Strength tests, such as the stretch, bursting strength and folding endurance, are increased. Thickness, substance wt. and transparency are increased also. The apparent and actual sp. gr. and the porosity show no differences. The sizing resistance is greater. J. L. P.

The Eastman colorimeter. WALTER BRECHT. *Papierfabr.* **24,** Festheft, 72–86 (1926) —American methods for measuring the color of paper are reviewed. A description of the construction and operation of the Eastman colorimeter is given, with especial reference to its use in the detn. of the color of paper. Data are tabulated covering the analysis of 10 papers. Other possible applications of the instrument in the paper industry are: (1) numerical detn. of the two-sidedness of paper, (2) relation between paper two-sidedness and color of the waste water, (3) detn. of the whiteness of pulps, and (4) detg. numerical values for paper fading. Cf. *C. A.* **20,** 2071. J. L. P.

Calculations relating to the strength of plane container walls with special reference to steam receptacles in so-called digesters of both ingot and cast iron. F. VON ZEIPEL. *Svensk Pappers-Tid.* **29,** 189–91, 222–4, 280–3, 314–5, 338–40(1926).—Data are given for calcg. allowable stresses for cast iron digesters. W. SEGERBLOM

De-inking and washing waste paper stock. J. J. O'CONNOR. *Paper Mill* **49,** No 40, 10, 12(1926).—Practical indications based on observations over the course of 5 yrs.' personal experience, with an outline of the procedure at present in use at the plant of the Mead Pulp and Paper Co. A 2,300-lb. batch of stock is agitated for 30–100 min. with a hot soln. of 90 lbs. of NaOH in 3,500 gal. of water. It is then circulated 20–40 min. in the defibering unit, consisting of a conical-shaped tank with a centrifugal pump connected to the apex, the discharge line from the pump being piped back into the lower section of the tank which gives a volcanic effect to the stock when operating. Before

screening, the hot stock (temp. 180° F.) is dild. with H_2O to a consistency of 0.7%, for which purpose fresh water is preferable to clarified water. This effect is attributed to the lower p_H of the clarified water which reduces the p_H of the mixt. and prevents as good a sepn. of the ink from the fibers. A. PAPINEAU-COUTURE

The regeneration of old printing paper. H. WENZL. *Wochbl. Papierfabr.* **57,** Sondernummer, 65–70(1926).—Essentially a review of the patent literature, under the following headings: (1) alk. and mech. treatments of printed paper, (2) use of oxidizing agents, and (3) use of emulsifying agents. J. L. PARSONS

Production control in the newsprint industry. G. D. BEARCE. *Mech. Eng.* **48,** 48–52(1926).—Descriptive. C. E. CURRAN

Metallographic studies on corrosion in the pulp and paper industry and wood grinders (LINDT) **9.** The structure of solid colloids (DUCLAUX) **2.** Apparatus for melting and casting celluloid (Brit. pat. 243,514) **1.**

Half stuffs and cellulosic materials. R. RUNKEL. U. S. 1,602,253, Oct. 5. Peat and various vegetable fibers are preliminarily treated at least partially to free the fibers from colloidal constituents, *e. g.*, by heating or freezing, and the fibers are alternately treated with alk. baths and with Cl while vigorously stirring at room temp. Cf. *C. A.* **20,** 111.

Cellulose films. J. E. BRANDENBERGER. U. S. 1,601,289, Sept. 28. A soln. of Na cellulose xanthate is coagulated and transformed into cellulose and then desulfurized by washing with a 0.5% NaOH soln. in H_2O.

Composite celluloid sheets. H. J. HANDS. Brit. 243,032, May 17, 1924. Sheets of cellulose derivs. other than nitrocellulose are enclosed between thinner sheets of celluloid or the like to produce a harder surface and to retain volatile plasticizing agents.

Polishing celluloid. M. B. MOORE. Brit. 243,397, May 27, 1924. See U. S. 1,589,813 (*C. A.* **20,** 3085).

Pulp high in resistant cellulose. G. A. RICHTER. U. S. 1,602,553, Oct. 12. Sulfite pulp is treated with alk. black liquor resulting from the alk. digestion of wood, to produce a pulp rich in α-cellulose. Cf. *C. A.* **20,** 3568, 3569.

Pulp. G. A. RICHTER. Can. 264,292, Sept. 14, 1926. Wood is digested first in an acid sulfite liquor under heat and pressure, and then further digested by addn to the mass of sufficient alkali in excess to maintain the alky. of the mass; this causes the soln. of the less resistant cellulose. Cf. *C. A.* **20,** 3568, 3569.

Pulp and paper manufacture. L. BRADLEY and E. P. MCKEEFE. Can. 268,181, Aug. 3, 1926. Wood pulp is produced by cooking wood under pressure and at an elevated temp. with an alk. sulfite cooking liquor contg. a high concn. of alk. sulfite and an amt. of H_2SO_3 or sulfite radical greater than that corresponding to the normal sulfite and less than that corresponding to the acid sulfite.

Paper-making machine. J. A. DEVINE. Brit. 243,637, June 27, 1925.

Paper-making apparatus. H. G. CRAM. U. S. 1,601,387, Sept. 28.

Paper-making apparatus. S. C. WENTZ. U. S. 1,603,226, Oct. 12.

Paper-making apparatus. ST. ANNE'S BOARD MILL CO., LTD. AND R. B. HEYS. Brit. 242,864, March 25, 1925.

Paper-making apparatus. J. T. MURPHY. U. S. 1,602,545, Oct. 12.

Suction-roll for paper-making machines. E. E. BERRY. U. S. 1,602,875, Oct. 12.

Removing ink from paper. O. WELSH. U. S. 1,601,193, Sept. 28. Paper is treated with a sapong. agent such as Na_2CO_3 and Na silicate in the presence of rosin or other suitable resinous compd. to remove printers' ink.

24—EXPLOSIVES AND EXPLOSIONS

CHARLES E. MUNROE

Additions, removals and changes in permissible list of explosives from January 1, 1925 to July 31, 1926. G. ST. J. PERROTT. *Repts. of Investigations, Bur. of Mines,* Serial No. 2770, 3 pp.(1926). CHARLES E. MUNROE

Explosions in compressed-air outfits. F. RITTER. *Z. Ver. deut. Ing.* **70,** 543–4 (1926).—The small quantity of fine oil mist in compressed-air pipes, receivers, etc., when ignited by an elec. spark due to expansion through an orifice, or by adiabatic compression, can cause explosions. No means of protection against ignition by the shock wave of the oil-satd. Fe oxides collecting at certain points has been found. E. M. S.

Firedamp explosions; the projection of flame. M. J. BURGESS. Safety in Mines Research Bd., *Paper* No. **27**, 14 pp.(1926).—The investigation was made by means of glass tubes, one, called the "explosion-tube," closed at one end and connected to a 2d tube, called the "extension-tube" and open at both ends, by means of a brass ring carrying a shutter. The explosion-tube was provided with electrodes to produce the igniting spark. The distance of projection of flame from firedamp explosions, initiated from the closed ends of tubes 5.5 and 9 cm. diam., was detd. under different conditions as regards (*a*) the length of the column of explosive mixt., (*b*) the size of the aperture between the explosion-tube and the extension-tube and (*c*) the character of the atm. in the explosion tube. The projection of flame into air in an unconstricted tube is between 5 and 6 times the length of the original column of explosive mixt., mixts. richer in CH_4 giving a longer injection than weak mixts. of corresponding explosive power, in consequence of the subsequent combustion of the excess of CH_4 in the air into which the flame is projected. When the aperture between the tube contg. the explosive mixt. and that contg. air was reduced, an increase in the length of the projected flame was obtained with mixts. contg. an excess of CH_4, unless the aperture was very small, when the length of projection with all mixts. of CH_4 + air was considerably reduced. The projection of flame into CO_2 was shorter than into air, it being about 3 times the length of the original column of the explosive mixt., with an unconstricted tube. If the aperture between the explosion-tube and the extension-tube was constricted, the projection of flame into CO_2 was reduced in length. Hence, it is suggested that success should attend the use of CO_2 at the mouth of a stopping when sealing off a gob fire, to act as a "blanket" to minimize the distance of projection of flame, should an explosion occur behind the stopping. CHARLES E. MUNROE

How are fires best prevented? K. HAERTING. *Z. angew. Chem.* **39**, 199–200 (1926).—A classification of various types of fire extinguishers adding to the classification of *Ibid* **38**, 629 the 3 classes: (1) Wet extinguishers giving foam; (2) wet extinguishers using CCl_4 or CH_3Br; (3) dry extinguishers contg. only dry powders. It is suggested that stone dust owes its efficacy in stopping fires to its prevention of free air circulation at many points near the flame and that most other successful extinguishers act in a similar way. M. A. YOUTZ

Fire hazards from hydrogen peroxide solution of high concentration. G. AGDE AND E ALBERTI. *Z. angew. Chem.* **39**, 1033–5(1926).—A fire occurred in a freight car loaded with H_2O_2 (60% soln.) in 25-l. containers. It was known that spontaneous combustion could occur with such a soln. and certain org. material; that the decompn. of H_2O_2 could be hastened by the presence of H_2SO_4, alkalies, substances of large sp. area (*e. g.*, metals) and by contact with org. matter; and that solns. of low concn. decompose more rapidly than those with high concn. Extensive expts. showed that in the presence of catalyzers favoring decompn., including finely divided metals, charcoal, dust, sweepings from wooden floors, many kinds of industrial wastes, etc., 60% H_2O_2 soln. brings about a rapid increase in temp. and ignition of packing materials. W. C. EBAUGH

Influence of sunlight on trinitrotoluene. DOMENICO LODATI. *Giorn. chim. ind. applicata* **7**, 572(1925).—L. confutes the assertion of Krauz and Turek (*C. A.* **19**, 2747) that TNT exposed to sunlight shows a greater sensitiveness to shock, which they attribute to the autoformation of picric and trinitrobenzoic acids. L. exposed TNT to diffuse light for 3 months instead of for 14 days as the others had done, and believes that under that condition TNT develops nitrous vapors. ROBERT S. POSMONTIER

The law of combustion of colloidal powders. HENRI MURAOUR. *Bull. soc. chim.* **39**, 981–8, 1115–9(1926).—A mathematical discussion of the law governing the combustion of smokeless powder. CHARLES E. MUNROE

Shipping of dangerous chemicals and explosives. ANON. *Chem. Age* (London) **15**, 292–3(1926).—A review of the regulations for carriage of various substances recently issued by the British Board of Trade in which the provisions for many important chem. substances are set forth. The regulations appear to cover both land and water transportation. CHARLES E. MUNROE

Safety container for primer: A device for decreasing the danger of loading primers in lead-zinc mines. W. T. CLOUD. *Am. Zinc, Lead and Copper J.* **18**, 4–5(1926).—The device is described with illustrations. CHARLES E. MUNROE

The propagation of flame in mixtures of methane and air. IV. The effect of restrictions in the path of the flame. W. R. CHAPMAN AND R. V. WHEELER. *J. Chem. Soc.* **1926**, 2139–47.—Expts. were conducted in a horizontal brass tube, open at both ends, and provided with quartz windows, the tube being also provided, at desired intervals, with restricting rings. The system was filled with CH_4-air mixts. of 9.5–10% CH_4 content (the mixt. in which flame normally travels fastest) to which Cu salts

were added to render the flame highly actinic, and the flame, on ignition, photographed. It is concluded that, during the propagation of flame in such a tube, the unburnt mixt. in advance of the flame-front is traveling as a current in the same direction as the flame which is therefore traveling in a medium that is itself in motion. The general effects of a restriction in the tube on the speed with which the flame travels from point to point along it can be explained as being effects on the speed of the medium in which the flame is moving. The sequence of events is as follows: When a restriction is ahead of the flame the resistance it offers to the movement of the unburnt mixt. causes the current, and therefore the flame, to move more slowly. Just as the resisting ring is approached, the convergence of lines of flow causes a slight acceleration of the current, and then of the flame. The flame passes through the restricting ring as a thin tongue and spreads internally, so that just beyond the restriction the burning "layer" of mixt. suddenly becomes considerably thicker than the normal and there is an abnormal amt. of the mixt. burned locally. There is, in consequence, an enhanced speed now given to the current of unknown mixt ahead of the flame, while part of the burning gas is forced through the restriction. Thereafter, the flame moves, relatively to the walls of the tube, more rapidly because the current of mixt in which it propagates is moving more rapidly.
CHARLES E. MUNROE

Trinitrotoluene. R H GARTNER. Brit. 243,550, Dec. 29, 1924. Trinitrotoluene is freed from tetranitromethane by passing it from a melting tank through nozzles where it is atomized by heated air or gases or steam into a settling chamber also supplied with heated air or gases or steam and to the lower portion of which cold air is supplied.

Low-density dynamite. W R. SWINT. U. S. 1,603,164, Oct. 12. A dynamite prepd. by use of a liquid explosive ingredient such as nitroglycerin together with NH_4NO_3 and bagasse pith has a d. such that a $1^1/_4''$ by $8''$ cartridge will weigh less than 146 g. and has a velocity less than 2500 m./sec.

Waterproofing match heads, stems or striking compositions with vulcanized rubber latex or emulsion. M. M. DESSAU Brit. 243,047, Aug. 14, 1924.

Miner's electric lamp for detecting combustible gases. W. M. THORNTON. Brit. 243,526, Nov. 27, 1924

Miner's electric lamp with a platinum detector for explosive and combustible gases. A. G. GULLIFORD. Brit. 243,496, Oct. 25, 1924.

25—DYES AND TEXTILE CHEMISTRY

L. A. OLNEY

The dyestuffs industry, forerunner of what? IRÉNÉE DU PONT. *Ind. Eng. Chem* **18,** 1002–5; *Am. Dyestuff Rept* **15,** 627–31.—A review of the progress of the dye industry is based upon statistics for 1914 (largely before the war, when U. S. A. was dependent upon Germany), 1919 (immediately after the war, with its 5-year embargo on the importation of dyes), and 1925 (most recent year available after a period of tariff protection). The embargo resulted in the establishment of a real dyestuffs industry, and—so far as tonnage is concerned—a commensurate progress has not been made during the period of tariff protection. The immense advances in America's production of photographic chemicals, medicinals, flavors, perfumes, synthetic tanning materials, synthetic resins, rubber accelerators, anti-knock fuels, new varieties of lacquer with nitrocellulose as a base, flotation practice, etc. are shown. Future advances include synthetic fuels for motors, better use of radiant energy, lessened ravages of corrosion, regulation of sleep by catalytic agents influencing the elimination of accumulated autointoxicants, prepn of substances to improve one's thinking, disposition and other mental attributes, etc. Coöperative research is recommended as a means for speeding up results "The greatest danger to further and phenomenal progress in chemistry is degeneracy in government."
W. C. EBAUGH

Selection of dyestuffs for various purposes. L. P. RENDELL. *Dyer & Calico Printer* **55,** 194–6(1926).—General considerations as applied to wool dyes. C. E. M

The cause of faults in piece dyeing. J. STEPHEN HEUTHWAITE. *Dyer & Calico Printer* **56,** 66–7(1926).
CHAS. E. MULLIN

Catalytic reactions utilized in dyeing. L. EYMER. *Rev. gén. mat. color.* **29,** 325, 352–3(1925).—A general discussion.
L. W. RIGGS

Dyeing with lichens. A. R. HORWOOD. *Dyer & Calico Printer* **56,** 110–1(1926).—General.
CHAS. E. MULLIN

Dyeworks alkalies from waste. E. T. ELLIS. *Dyer & Calico Printer* **56,** 112–3

(1926).—Suggestions are made for the prepn. of alkalies from waste and other materials. CHAS. E. MULLIN

Dyeing cotton with acid dyes. A. P. SACHS. *Textile Colorist* **48**, 601-3(1926).—Immunized cotton, produced by treating normal cotton with toluenesulfonlychloride, is treated with NH_3 or some other base capable of introducing the amino group. This basic group in the cellulose gives it a strong affinity for the acid dyestuffs, with which it appears to form a compd. CHAS. E. MULLIN

The dyeing of cotton artificial silk piece goods. H. BLACKSHAW. *Dyer & Calico Printer* **55**, 130-1, 192-3, 205, 225(1926).—The dyeing of viscose and acetate silk in combination with cotton is discussed. CHAS E. MULLIN

Pigments. MARCEL DEJODE. *Rev. gén. mat. color.* **29**, 292-4, 328-9; **30**, 104-5, 137 8, 200-1(1925-6).—Particular directions are given for dyeing cotton with *m*-nitroaniline orange, *p*-nitroaniline red, α-naphthylamine Bordeaux, and benzidine brown. L. W. RIGGS

Reduction products of azo dyes. W. C. HOLMES. *Am. Dyestuff Rept.* **14**, 647-50, 686-7, 705, 732-3, 740, 753-4, 776, 807-9, 821-2, 840(1925); **15**, 72-4, 100-1, 108, 179 81, 221-3, 240-2, 269-71, 302-4, 374-6, 405-7, 436-8, 450-2, 490-2, 523-5, 587-9 (1926) —These first 20 papers on this subject give a digest of all available information on the reduction products of 268 dyes published in the Color Index, together with data on such properties and reactions as would be of service in their identification. The work is still in progress. L. W. RIGGS

Identification of naphthalenoid reduction products of azo dyes. R. B. FOSTER AND T. H. HANSON. *J. Soc. Dyers Colourists* **42**, 272-5(1926).—The successive steps employed were: reduction of the dye to amino compds., isolation of the volatile reduction products by distn., isolation of the non-volatile products by extn. with C_6H_6, and the application of a reagent to produce a color reaction. In the latter step 15 reagents were used and the results are tabulated on a sheet equiv. to 9 pages of the journal. L. W. RIGGS

Developed or azo colors on acetate silk. CHAS. E. MULLIN. *Canadian Colorist & Textile Processor* **6**, 228-32, 262-3, 276(1926).—The general theory and methods of application. CHAS. E. MULLIN

The ionamine dyes on acetate silk. CHAS. E. MULLIN. *Canadian Colorist & Textile Processor* **6**, 292-9(1926).—The theory, development, constitution and application of these dyestuffs, as well as the properties of the resulting colors on the fiber are discussed. CHAS. E. MULLIN

Special components for developed colors (on acetate silk). CHAS. E. MULLIN. *Canadian Colorist & Textile Processor* **6**, 268-77(1926).—The *Acedronoles, Acetylines, Azonides, Azonines, Azoles, Azoics, Silkons,* and other azo color components are discussed CHAS. E. MULLIN

Identification and dyeing of artificial silk. ANON. *Chemicals* **26**, No. 15, 20-1 (1926) —*Lustron* is sol. in $CHCl_3$ but *Celanese* is not sol., merely forming a jelly. CHAS. E. MULLIN

Swelling agents in dyeing acetate silk. CHAS. E. MULLIN. *Canadian Colorist & Textile Processor* **6**, 213(1926).—Description of an obsolete method. C. E. M.

Dyeing acetate silk by saponification. CHAS. E. MULLIN. *Canadian Colorist & Textile Processor* **6**, 198-200, 210(1926); cf. *C. A.* **20**, 2908 and 3087.—While this method is no longer used in dyeing, it is of interest to dyers in connection with dyeing troubles CHAS. E. MULLIN

Mordants from waste materials. E. T. ELLIS. *Dyer & Calico Printer* **56**, 70-1 (1926).—The prepn. of Al, Cu, Fe and Sn mordants from waste materials is briefly discussed. CHAS. E. MULLIN

Formic acid. H. O. RICHARDSON. *Dyer & Calico Printer* **56**, 104-5(1926).—The uses of formic acid as applied to textile and dyeing industries are given. CHAS. E. MULLIN

Early history of the redwood industry in tropical America. C. D. MELL. *Textile Colorist* **48**, 609-11(1926). C. E. MULLIN

Auramine. JAMES SCOTT. *Dyer & Calico Printer* **56**, 90-2(1926).—A discussion of the reactions of auramine on the fiber and 6 photomicrographs showing its cryst. forms. CHAS. E. MULLIN

Protein compounds. III. CHAS. E. MULLIN. *Am. Dyestuff Rept.* **15**, 607-15 (1926); cf. *C. A.* **20**, 3352.—Work on base-protein-acid compds. and the halogen and S compds. of the proteins is reviewed. L. W. RIGGS

The tassah silk industry of Bihar. ANON. *Silk J.* **3**, No. 27, 51(1926).—The characteristics of this particular type of silk are briefly reviewed. C. E. MULLIN

Pioneers of artificial-silk production. I. Sir Joseph Wilson Swan. WM. BENNETT AND A. H. HARD. *Silk J.* **3,** No. 25, 59–60(1926). **II. Count Chardonnet.** *Ibid* No. 26, 64–5. **III. W. P. Dreaper.** *Ibid* No. 27, 62–3. **IV. Charles Frederick Topham.** *Ibid* No. 28, 59–60, 64.—Bibliography with pictures and an account of their work on rayon. CHAS. E. MULLIN

Artificial-silk standards. N. U. BERCHIN. *Chem.-Ztg.* **50,** 643(1926).—In attempting to set a standard of quality for artificial silk, B. compares the most important measurable properties of rayon with analogous properties of natural silk. He compares the product of the tensile strength dry, by the tensile strength wet, by the elasticity of rayon with the analogous product of natural silk. This product for natural silk is 2.5 g./denier × 2 g. × 20 = 100. For rayon 2 g. × 0.65 g. × 20 = 26. But, considering the factors of luster whiteness, and tendency to become yellow a ratio more favorable to rayon is given. For natural silk 2.5 g. × 2 g. × 20 × 0.5 (whiteness factor) × 0.5 (luster) × 0.95 (yellowing tendency) = 23.95. For rayon 2 g. × 0.65 g. × 20 × 1 (whiteness) × 1 (luster) × 1 (yellowing tendency) = 26. B. recognizes the difficulties in accurately applying these standards in practice. C. E. P. JEFFREYS

The finishing of artificial-silk fabrics and mixed fabrics. WM. BENNETT. *Silk J.* **3,** No. 26, 66–7(1926).—The conditioning, lustering, stiffening and finishing are discussed and several finishing mixt. formulas are given. CHAS. E. MULLIN

Finishing artificial silk and mixture fabrics for special purposes. WM. BENNETT. *Silk J.* **3,** No. 28, 61, 66(1926).—Finishing artificial flowers and leaves, shoe and slipper linings, etc. CHAS. E. MULLIN

The latest products in artificial silk. W. SUCHANCK. *Silk J.* **3,** No. 27, 57–60 (1926).—A few of the recent developments are briefly discussed. CHAS. E. MULLIN

New mercerizing press for artificial silk production. ANON. *Silk J.* **3,** No. 27, 74(1926).—A description of the M. Hausser press for the removal of caustic soln. from the mercerized cellulose in the manuf. of viscose. CHAS. E. MULLIN

Treating silks in the cleaning plant. F. M. HERFURTH. *Canadian Colorist & Textile Processor* **6,** 312(1926).—A wet-dry process of cleaning is briefly described wherein the silk dress is first wet-out with gasoline or solvent contg. glacial AcOH, EtOAc and acetone, and then with H_2O contg. "liquid seal oil," soap or tetrapol. CHAS. E. MULLIN

The general properties of acetate silk. CHAS. E. MULLIN. *Textile Colorist* **48,** 459–62(1926).—A discussion of the phys., chem. and textile properties, except dyeing properties, of acetate silk. Eleven tables. CHAS. E. MULLIN

Increase in the strength of wet artificial silk by the action of formaldehyde. WALTER BRUCKHAUS. *Oesterr. Chem.-Ztg.* **29,** 156–7(1926).—The treatment of artificial silk with HCHO aims to change the fiber, tender when wet, into a form more resistant to water and alkalies. Either skeins or piece goods are treated by impregnating them in a soln. made of 2 kg. alum, 25 kg. lactic acid (30%) and 12 kg. HCHO (40%) in 35–40 l. H_2O. The material is centrifuged in an ebonite container to 100% moisture, carefully dried at 60°, then soaped in soln. of 5–7 g. Marseillaise soap per l., revived with 1% lactic acid or 0.3% AcOH and dried at low temp. This treatment gives greater stability toward moisture and alkalies and greater absorptive power for dyes. The compn. of the impregnating bath may be different for the different silks. The ratios given for the strength of the untreated to treated silk are for nitrosilk: dry 100:140, wet 100:350; for viscose and cuproammonium, dry 100:135, wet 100:355. The treated silk is whiter, more pliable and makes up better. C. E. P. JEFFREYS

The purification of waste liquors from artificial-silk plants and mercerization processes. A. SCHROHE. *Papierfabr.* **24,** Tech.-Wiss. Teil, 297–9(1926).—A brief review of German patents. J. L. PARSONS

The purification of waste liquors from artificial-silk factories and after mercerization. E. PROFELD. *Papierfabr.* **24,** Tech.-Wiss. Teil, **24,** 520–1(1926).—A brief discussion of 5 German patents, nos. 350,428, 355,836, 381,798, 388,791 and 322,461, relating to the purification of waste liquors from rayon and mercerization operations. J. L. PARSONS

Silk and rayon. R. PRESGRAVE. *Canadian Colorist & Textile Processor* **6,** 234–5, 244–5(1926).—The fibers are compared on the basis of luster, dyeing properties, handle, conductivity, hygroscopicity, tensile strength, elasticity, ductility, friability, resiliency, sp. gr., cleanliness, plasticity, imperfections and price. CHAS. E. MULLIN

Rayon experimental plant and training school. A. G. PERL. *Textile World* **70,** 2004–5(1926).—A brief description of the exptl. plant, which is also used as a training school, of Oscar Kohorn and Co., Chemnitz and Vienna. CHAS. E. MULLIN

Future of rayon depends upon research. W. F. EDWARDS. *Textile World* 70, 2005–6, 2018(1926). CHAS. E. MULLIN

Rayon manufacture. E. WURTZ. *Ver. deut. Ing.* 69, 1581–8(1925).—A well-illustrated description of the practice of viscose rayon manuf., with considerable detail as to design, productivity and power requirements of machinery. In the operations described, the raw cellulose is brought to a definite H_2O content in special driers, and mercerized with 18.5% NaOH soln., made from caustic which assays at least 97% NaOH. The immersion takes 2 hrs., and the liquor is kept at 15°. The pressure applied in squeezing out is sufficient to produce an alkali cellulose which weighs 3.2 times the wt. of the dry cellulose in it. The aging of the shredded alkali-cellulose is carried out at 23–25° in closed 35 l. cans. Hexagonal rather than round sulfiding drums are preferred and these should have a capacity of 1300 l. to 100 kg. dry cellulose. The final viscose soln. contains 7.5–8.0% cellulose and 6.5–7.0% NaOH. Spool spinning is more costly than centrifugal spinning but produces better results. E. R. C.

Progress in British rayon industry. J. GUTHERIE OLIVER. *Textile World* 70, 2006, 2020(1926). CHAS. E. MULLIN

Processing cotton-rayon piece goods. W. W. CHASE. *Textile World* 70, 2016–8 (1926).—The scouring, bleaching and dyeing of cotton-rayon piece goods are discussed. CHAS. E. MULLIN

Analysis of rayon-worsted yarns. ANON. *Textile World* 70, 2026(1926).—In the analysis of *acetate silk-wool* mixts. it is suggested to dissolve out the rayon by boiling the sample in 70% or stronger AcOH. A correction factor is used in calcg. the percentage of wool. CHAS. E. MULLIN

Processing rayon hosiery. ANON. *Textile World* 70, 2023(1926).—Bleaching, dyeing and finishing are briefly discussed. CHAS. E. MULLIN

Domestic rayon output increases about 20%. D. G. WOOLF. *Textile World* 70, 1996–7(1926); cf. *C. A.* 20, 293.—Tables of production and importation are given. CHAS. E. MULLIN

Links in the European rayon chain. ANON. *Textile World* 70, 2002–3(1926).—A description of the international connections of the various producers. C. E. M.

Ripening of viscose. R. O. HERZOG. *Papierfabr.* 24, Festheft, 94–6(1926).—Empirical formulas are given for calcg. the relative rates of reactions occurring during the viscose-ripening process; this appears to be a slow coagulation in which the secondary particles, formed from the primary ones, arrange themselves in rod form. Salting-out, modulus of elasticity and viscosity are discussed. J. L. PARSONS

Viscose as a textile finish. E. H. MORSE. *Textile World* 70, 1709–11(1926).—Viscose finishes are permanent and waterproof but little information is available regarding their use. Very general information regarding their application is given. CHAS. E. MULLIN

Differentiation between viscose and copper silks by color reactions. P. KRAIS. *Papierfabr* 24, Tech.-Wiss. Teil, 330–1(1926).—The Rhodes, Götze and Cassella tests for differentiating between viscose and copper silks are compared. The Rhodes $AgNO_3$ test and the Cassella coloration with naphthylamine black 4B are recommended as giving the best color reactions, independent of the denier of the fiber. J. L. P.

Distinguishing viscose from cuprammonium (silk). W. T. SCHREIBER AND H. HAMM. *Textile World* 70, 2029(1926).—A 5-g. sample of viscose or cuprammonium silk is treated in a flask with 100 cc. H_2O and 3 cc. concd. H_2SO_4 on a moderately boiling steam bath for 4 hrs., the mouth of the flask being entirely closed by a diaphragm of filter paper satd. with a 10% Pb acetate soln. The S compds. present in viscose cause a brown or black stain on the paper, which does not appear in the cuprammonium silk. It was impossible to identify viscose from traces of CS_2 remaining in it. CHAS. E. MULLIN

Textile analytical microscopy. W. GARNER. *J. Soc. Dyers Colourists* 42, 261–72 (1926).—The technic of section cutting of fibers and the appearances of various fibers under the microscope are described. L. W. R.

Possibilities of so-called "staple fiber." W. HOWARD CANNING. *Textile World* 70, 2001(1926).—The uses and possibilities of staple fiber, also called *artificial wool, Vistra* and *Sniafil*, are discussed. CHAS. E. MULLIN

Oils and oil products in textile processes. H. C. ROBERTS. *Textile World* 70, 2021–2(1926).—The application and removal of oils for lubrication, the use of sulfonated oils in dyeing and softening oils are discussed. CHAS. E. MULLIN

Amidation of cotton. P. KARRER AND W. WEHRLI. *Helvetica Chim. Acta* 9, 591–7 (1926).—Cotton may be amidated by first treating with toluenesulfonyl choride and treating the product with aq. ammonia or an aliphatic amine. The amidated

cotton possesses an affinity for acid dyes. Aromatic amines may also be used but the affinity in the product formed, for acid dyes is not so strong as with the NH_3 or aliphatic amines. R. C. NEWTON

Printing cotton by the indigo-glucose method. ANON. *Textile Colorist* **48**, 617–20(1926).—Formulas are given. CHAS. E. MULLIN

Detection of mercerized cotton. CHAS. E. MULLIN. *Textile Colorist* **48**, 599–601 (1926).—A review of the various methods used in detecting the mercerization treatment on cotton and in the estn. of the extent of the treatment, as well as the differentiation of mercerized cotton and rayon. CHAS. E. MULLIN

Celanese as a fabric builder. C. W. PALMER. *Textile Recorder* **44**, No. 520, 85–6(1926).—The properties of celanese and cotton, in relation to weaving, are considered. CHAS. E. MULLIN

The treatment of celanese and its uses. R. V. PATCHETT. *Textile Recorder* **44**, No. 522, 77–9(1926).—The winding, warping and weaving of celanese are considered. Where sizing materials contg. gelatin are present, the goods must be soaked for some time in cold H_2O to swell the gelatin before heating the bath to remove the size. CHAS. E. MULLIN

Theory and practice of drying as applied to woolen and cotton products. FREDERICK KERSHAW. *Textile Colorist* **48**, 626–30(1926). CHAS. E. MULLIN

Kapok. ANON. *Textile Recorder* **44**, No. 521, 45–6(1926).—Its production in the British Empire, cultivation and uses. CHAS. E. MULLIN

The recovery of by-products from wool-scour effluent. MEDALION. *Textile Recorder* **44**, No. 521, 55–7(1926).—A brief review of the various methods which have been proposed or used for the recovery of wool grease and K from used scouring liquors. CHAS. E. MULLIN

Electrical refrigeration in textile mills. F. W. STURTEVANT. *Textile World* **70**, 1307–8, 1873–5(1926). CHAS. E. MULLIN

The steam accumulator in textile mills. C. L. HUBBARD. *Textile World* **70**, 1303–6(1926). CHAS. E. MULLIN

The steam accumulator in the textile industry. K. GEHRENBECK. *Apparatebau* **38**, 219–23(1926); 6 cuts.—Descriptions of a hot-H_2O accumulator and of Ruth's accumulator (cf. *C. A.* **17**, 2524, 2977; **18**, 2445, 2981; **19**, 2275). J. H. MOORE

A less hazardous dry cleaning solvent. LLOYD E. JACKSON. *Canadian Dyer & Calico Printer* **6**, 185–8(1926).—The present requirements and solvents are discussed, and specifications for a suitable solvent are given. CHAS. E. MULLIN

The spectrophotometric examination of dyes and indicators (PRIDEAUX) **2**. Effect of adrenaline and choline on the development of silk worms (FARKAS, TANGL) **11**. Corrosion of Ni-alloy singe rolls (TRAVIS) **9**. Dyeing of leather (Brit. pat. 243,144) **29**. Benzanthronyl nitriles (Brit. pat. 243,026) **10**. Drying silk (U. S. pat. 1,567,031) **13**.

REINTHALER, FRANZ: **Die Kunstseide.** Berlin: J. Springer. 165 pp. 14.40 M. Reviewed in *Papierfabr.* **24**, 474–5(1926).

Dyes. F. GUNTHER. U. S. 1,567,731, Dec. 29, 1925. Products for dyeing cellulose and the like are obtained by the action of "carbonic acid halogenides" such as phosgene or alkylchloroformates on aromatic *o*-aminocarboxylic acids other than the uncolored anthranilic acids. The products combine with cellulose and the combination may be subjected to diazotization and combination with other dye components. Several examples are given.

Dyes. BRITISH DYESTUFFS CORPORATION, LTD., J. BADDILEY, J. HILL and A. RILEY. Brit. 243,115, Sept. 17, 1924. Monoazo dyes are produced by diazotizing the anhydro bases made by reaction of at least 1 mol. proportion of CH_2O with 1 mol. proportion of an aromatic amine in the presence of acid and coupling with sulfonated coupling components. The products dye wool yellow to red to brown shades fast to milling. Numerous examples are given.

Dyes. BADISCHE ANILIN & SODA FABRIK. Brit. 242,837, Feb. 18, 1925. Dyes similar to or identical with those described in Brit. pat. No. 204,249 (*C. A.* **18**, 908) are obtained by condensing a 1-halogen-2-aminoanthraquinone or its derivs. with terephthaloyl chloride, oxalyl chloride or other aromatic compd. contg. at least 2 substituents with reactive C atoms (such as carboxylic chloride groups or di- or tri-halogenmethyl groups) and treating the products with substances capable of giving off S, such as sol. sulfides or polysulfides or xanthates. The products dye cotton from the vat in yellow shades.

Dyes. Badische Anilin & Soda Fabrik. Brit. 242,620, Nov. 7, 1924. Isodibenzanthrone dyes are obtained by treating with alk. condensing agents, with or without inert diluents, benzanthrone thio ethers or substitution derivs. having a free 2-position. Alkyl, aryl, anthraquinonyl, benzanthronyl and other thio ethers may be used, and the reaction may, *e. g.*, be carried out in the presence of KOH and EtOH at a temp. of 135–145°. Benzanthrone *p*-thiocresyl ether (which may be used as one of the starting materials for these dyes) is made by heating chlorobenzanthrone with *p*-thiocresol and alc. KOH. Benzanthronyl sulfide is obtained by heating benzanthrone mercaptan with Cu and $C_{10}H_8$.

Dyes. Soc. anon. pour l'ind. chim. à Bâle. Brit. 242,867, March 30, 1925. Insol. azo dyes are produced either in substance or on the fiber by coupling unsulfonated diazo, tetrazo, diazoazo or similar compds. with the *p*-hydroxynaphthyl-1,3,5-triazine derivs. such as described in Brit. pat. No 220,302 or 240,731 (*C. A.* **20,** 2252). The products made in substance may be used for the prepn. of lakes. The dyes produce various shades ranging from yellowish red to blue and black. Numerous examples are given

Dyes. A. Zinke. Brit. 242,306, Nov. 3, 1924. Diaroylhalogenperylenes are treated with basic alkali or alk. earth metal compds. at high temp., preferably in the presence of an org. solvent; *e. g.*, dibenzoyldibromoperylene is treated with powd KOH in boiling aniline or with molten alkali; the product dyes cotton blue from a blue vat Several other examples are given. Cf. *C. A.* **20,** 3576.

Dyes and intermediates. Farbenfabriken vorm. F. Bayer & Co. Brit. 243,557, Jan 12, 1925. Carbazolecarboxylic acid amides are prepd. by condensing the corresponding carboxylic acids with primary or secondary aliphatic or aromatic amines in the presence of PCl_3 or other suitable condensing agent. Carbazolic acid amides are converted into indophenols by condensation with *p*-nitrosophenols. Sulfuretted dyes are prepd. from the indophenols by ordinary sulfurizing processes. They dye cotton from a hyposulfite vat dark blue, bluish black and greenish black shades. Various examples are given.

Trisazo dye. H. Schweitzer. U. S. 1,602,991, Oct. 12. A dye giving bright fast greenish blue shades on cotton is formed from 3,6-disulfobenzene-1-azo-4-naphthalene-1-azo-4-naphthalene-1-diazo-2-ethoxy-6-sulfonic acid by coupling with 2-phenylamino-5-naphthol-7-sulfonic acid in the presence of pyridine. Other dyes giving blue and green shades may be formed from similar components.

Azo dye. W. Duisberg, W. Hentrich, J. Huismann and L. Zeh. U. S. 1,603,002, Oct 12. 4-Acetylethylaminobenzene-1-azo(*N*-acetylaminoethyl)-2-amino-8-hydroxynaphthalene-3,6-disulfonic acid dyes wool reddish brown level shades fast to light and to milling.

Azo dyes. A. Zitscher. U. S. 1,594,865, Aug. 3. Azo dyes are formed by combining diazo compds., not contg. a sulfonic or carboxylic group, with acetoacetyl compounds of the general formula: $YCOCH_2CONHRN{:}NR'$, in which Y represents any radical of the hydrocarbon series contg. from 1 to 6 C atoms, R an aryl residue and R′ an aromatic residue. A large number of examples are given, the dyes produced giving, in general, yellow or orange shades.

Azo dyes containing a diphenylurea nucleus. H. Wenker. U. S. 1,594,805 Aug 3 Dyes producing green shades on cotton are formed from the Na salts of such compds as *p*-aminobenzeneazo-3,6-disulfo-1-amino-8-naphtholazobenzene and *p*-aminobenzeneazosalicylic acid by treatment with phosgene in Na_2CO_3 soln. The dyes produced can be readily discharged from cotton by $Na_2S_2O_4$.

Yellowish red azo dyes. H. Wagner and A. Funke. U. S. 1,595,269, Aug. 10 Dyes giving lakes fast to light are produced by combining 3-nitro-4-diazo-1-phenol ethers, *e. g*, the Et or Me ethers, with an acetoacetanilide which is substituted either by an alkyl group in *o*-position to the NH_2 group or by an alkyloxy group in *p*-position to the NH_2 group, *e. g.*, acetoaceto-*o*-toluidide or acetoaceto-*p*-anisidide.

Dyes of the anthraquinone series. P. Schetelig. U. S. 1,568,627, Jan. 5. Nuclear-halogen derivs. of 1,3,5-triazine such as cyanuric chloride are caused to react on -(or 8)-amino-2,1-anthraquinoneacridones, forming dyes which produce fast red violet to bordeaux and gray tints on cotton.

Oxazine dyes of the anthraquinone series. R. E. Schmidt and B. Stein. U. S. 1,596,460, Aug. 17. Purpuramide may be oxidized alone to homonuclear quinoni compds and these may then be condensed with substituted benzoic acids such as salicylic acid, cresotinic acid, anthranilic acid, or phenylglycine-*o*-carboxylic acid to produce, probably, heteronuclear quinones or quinoneimides, and these products are reduced to oxazines. MnO_2 in H_2SO_4 soln. may be used as the oxidizing agen

and SO_2 or an alkali metal H sulfite as the reducing agent. The oxazine dyes produced dye wool in an acid bath blue to green shades; on wool mordanted with Cr or Al salts they give similar shades fast to milling and to light. Several examples are given.

Green sulfurized dyes. E. REBER and J. FRÖHLICH. U. S. 1,568,622, Jan. 5. Indophenols which are obtained from *p*-aminophenol and *N*-alkyl or aralkyl-α-naphthylamine may be converted into sulfonated derivs. of 1-alkyl- or 1-aralkylamino-4-*p*'-hydroxyphenylnaphthylamines by treatment with salts of H_2SO_3 such as $NaHSO_3$. By heating these sulfonated derivs. with alkali metal polysulfides in the presence of Cu, sulfurized dyes are obtained which dye vegetable fiber green tints fast to boiling alk soap solns

Alkyl-arylsulfaminonaphtholsulfonic acid azo dyes. W. NEELMEIER and T NOCKEN. U. S 1,602,776, Oct 12 Diazotized *o*-phenetidine or other diazotized aromatic amines are combined with alkyl-arylsulfaminonaphtholsulfonic acids such as 1-ethyl-*p*-toluenesulfamino-8-naphthol-3,6-disulfonic acid to produce dark red to blue powders, sol in H_2O and dyeing wool from an acid bath from red to blue fast shades

Acetoacetyldehydrothiotoluidine and similar compounds. A. ZITSCHER. U. S 1,594,866, Aug 3. Acetoacetyldehydrothiotoluidine is formed by heating acetoacetic acid ester with dehydrothiotoluidine in a diluent such as $C_{10}H_8$. It m. 170–2° (with slight decompn). Similar reactions may be carried out with other bases and other acylacetic acid esters such as benzoylacetic acid ester. The products may be used as dye components

Diacylacetyldiamino compounds of the diaryl series. A. ZITSCHER and R. SCHMITT U. S. 1,594,864, Aug 3. Compds. of this type (which are dye intermediates) are formed by heating diaminodiaryl bases with acylacetic acid esters in a diluent. Among the compds which are thus prepd are: diacetoacetyl-*o*-tolidine, m. 204–5° (decompn.) diacetoacetyl-*o,o*'-dichlorobenzidine (decomposes at 145–7°); diacetoacetyl-*m,m*' dichlorobenzidine (decomposes at 212°); diacetoacetyldianisidine (m. 164–5° with decompn.); dibenzoylacetylbenzidine, m. 248° (decompn.); and dibenzoylacetyl-*o*-tolidine, m 233° (decompn).

Acylacetyl compounds containing azo or azoxy groups. A. ZITSCHER. U. S 1,594,867, Aug. 3. Compds of this type (which are suitable for the manuf. of dyes) are obtained by heating acetoacetic acid ester or its homologs or analogs, such as benzoylacetic acid ester, with monoamino bases such as benzeneazo-1-naphthylamine or 4-aminoazobenzene. Several specific examples are given.

Phenol-sulfur compounds. AKT.-GES. FÜR ANILIN-FABRIKATION. Brit. 242,974 Nov. 14, 1924. The process of Brit pat. No. 232,958 (*C. A.* **20**, 296) for prepg. colorless mordants by the action of a phenolsulfonic acid upon a resinous substance prepd from a phenol and S chloride is modified by first sulfonating the resinous substance with strong H_2SO_4 while heating, *e. g.*, to 90–100°, and condensing the product with a phenol (present in excess) at a higher temp., *e. g.*, 210–220°. Excess phenol is finally distd off *in vacuo* at 240°.

Dyeing cellulose acetate. BRITISH CELANESE, LTD., AND G. H. ELLIS. Brit. 242,393, Sept. 19, 1924 In the process described in Brit. pat. No. 219,349 (*C. A* **19**, 579), instead of the solubilizing agents for the dyes specified in the original pat there are used sulfo aromatic fatty acids, such as sulfobenzenestearic acid, or their derivs such as sulfophenolstearic acid or sulfonaphthalenestearic acid or salts of these acids are used. Various examples and details are given.

Dyeing cellulose acetate. BRITISH CELANESE, LTD., G. H. ELLIS and W. O. GOLDTHORPE. Brit. 242,711, Aug. 14, 1924. In dyeing with relatively insol. dyes or org. compds for the production of dyes on the material, there are employed, in conjunction with the solubilizing agents specified in Brit. pat. 219,349 (*C. A.* **19**, 579), secondary or auxiliary solvents such as alkyl or alkylene halides (*e. g.*, $C_2H_2Cl_4$ or C_2HCl_3), simple or mixed cyclic or aromatic derivs. contg. 1 or more NH_2, Cl or OH groups (*e. g.*, cresols, alkylanilines, toluidines, chlorophenols or polychlorobenzenes), and hydrogenated derivs. of these or other aromatic compds. (*e. g.*, hexahydrophenol, hexahydrocresols, hexahydrobenzene, decahydronaphthalene or tetrahydronaphthalene Numerous examples are given. See Brit. pat. No. 224,925 (*C. A.* **19**, 1952).

Dyeing and printing cellulose esters. R. METZGER. U. S. 1,602,695, Oct. 12. Goods formed of cellulose acetate or other cellulose esters are treated with the sulfamic acid Na salt derived from 1,4-diaminoanthraquinone or other H_2O-sol. sulfamic acid derived from a colored amino compd. which is not a dye of itself, and the product may be further treated with azo dye components.

Dyeing with multicolor effects. J. RATH and W. CHRIST. U. S. 1,594,853, Aug. 3. Vat dyes such as algol brilliant violet R or indanthrene blue G C or alizarin indigo

7 G are superposed on vegetable fiber material portions which have been previously treated with combinations of arylamides of 2,3-hydroxynaphthoic acid or other azo dyes which are resistant to the action of boiling dil. NaOH soln. in the presence of cellulose (*i. e.*, fast to kier-boiling).

Dyeing rugs and similar articles. W. E. Olson. U. S. 1,602,446, Oct. 12. After applying the dye, the material is folded over a supporting device with small projections which contact with the material.

Apparatus for dyeing or other treatments of yarns or other fibrous or textile materials. A. Manzoni and E. Muller. Brit. 246,359, Nov. 18, 1924. Atomizers are arranged to spray H_2O and other treating liquids by the action of steam and air.

Dyeing apparatus. J. Dean. Brit. 242,790, Nov. 15, 1924.

Apparatus for dyeing fabrics in lengths. E. Cadgene. Brit. 242,936, Nov. 13, 1924.

Apparatus for dyeing yarn skeins, etc. J. Schlumpf. Brit. 242,857, March 14, 1925.

Vat dyeing apparatus with paddle wheels. H. E. Brewin and A. C. Mackey. U. S. 1,600,973, Sept. 28.

Textile material. J. F. Moseley. Can. 263,333, Aug. 10, 1926. A process for finishing textile materials in which agglutinant-sizing materials are used in conjunction with a colloidal silicate. Cf. *C. A.* **19**, 3600.

Artificial silk. M. Hirasawa. U. S. 1,603,080, Oct. 12. Fibrous substances such as silky cocoon material, the chief constituent of which is fibroid, are dissolved in a soln. of $ZnCl_2$ and the liquid is forced out of capillary nozzles and treated successsively with a soln. of an alkali acid sulfite such as NH_4HSO_3 and with an alc. CH_2O soln.

Artificial silk. S. Toda. Brit. 243,009, Nov. 14, 1924. See U. S. pat. 1,590,-784 (*C. A.* **20**, 3088).

Artificial silk. A. Eichengrün. Brit. 243,350, Nov. 20, 1924. Solns. of acetone-sol cellulose acetates or mixts. of these with $CHCl_3$-sol. cellulose acetates are prepd. by the use of CH_2Cl_2. Concd. solns. are obtained which permit high-speed spinning and a very short spinning distance. Softening agents, fillers and dyes may be used and a small proportion of MeOH or its homologs is added to form a suitable solvent together with the CH_2Cl_2. Acetone, triacetin, Et formate, a mixt. of EtOAc and alc. or a mixt. of alc. and C_6H_6 also may be used in the solvent, and the soln. may be used for making threads, ribbons or the like or for coating nitrocellulose silk.

Artificial silk from cellulose acetate or similar compositions. H. B. Roy. U. S. 1,602,125, Oct. 5. A filament-forming soln. is discharged into a current of heated air through which the filaments are conveyed and which serves to evap. the solvent from them and the filaments are then led out of the casing through which the air current passes and are continuously wound in the outside atm. An app. is described.

Artificial silk from viscose. C. Becker and A. Bernstein. Brit. 242,993, Nov. 14, 1924. Artificial silk prepd. from viscose, after the initial winding on bobbins and with or without washing to remove remnants of the acid coagulating-bath, is withdrawn from the bobbins, passed through a warm soln. of NaOH or other desulfurizing bath, then led through a weak acid bath and rewound by a winding device operating in washing H_2O.

Weighting silk. J. Roskow. U. S. 1,602,840, Oct. 12. Silk is treated with a soln. of $BaCl_2$ or other sol. Ba salt and, after drying, treated with a soln. of a sol. sulfate, e. g., Na_2SO_4 or H_2SO_4.

Sensitizing solution for fabrics. G. I. Keel. U. S. 1,597,899, Aug. 31. In order to produce designs on fine silk or similar fabrics (so that they are in part rendered pervious to colors sprayed through them in multi-color reproductions by the multi-screen color-spray method) the fabrics are exposed to light through a photographic negative after treatment with a compn. formed from glue, H_2O $(NH_4)_2Cr_2O_7$, egg albumin, clear NH_3 soln. and $AgNO_3$.

Testing the strength of yarns or similar materials. C. H. Robbins. U. S. 1,602,-213, Oct. 5. A method of standardizing humidity of material to be tested and of the atm. in which the tests are carried out is described.

Apparatus for mercerizing yarns. W. Koenigs and J. Kam. Brit. 243,380, Nov. 1924.

Treating wool, silk and other textile materials with a series of soap solutions. C. Duhamel and Compagnie Generale des Industries Textiles. Brit. 243,360, Sept. 7, 1923.

Shrinking woolens. G. H. WEITZEL. U. S. 1,601,838, Oct. 5. See Brit. 221,422 (*C. A.* **19,** 900).

Treating cotton with oil. R. B. SMITH. Brit. 242,593, Nov. 8, 1924. See U. S. 1,550,396 (*C. A.* **20,** 116).

Fabrics (for automobile tops or other uses) coated with a vulcanized mixture of rubber and glue. J. H. MASON. U. S. 1,602,986, Oct. 12.

Felting animal fibers. R. BACH. Brit. 243,301, Nov. 20, 1924. Hair is made into felts adapted for manuf. of hats after treating the fibers with aldehyde or ketone corrosives or with metallic salt corrosives such as those contg. Hg. The treatment may be applied to loose fibers, half-fulled felt or to hides, and among the suitable reagents specified are CH_2O, AcH, BzH or their compds. with bisulfites, acetone, acetoacetic ester, acetophenone or mixts. or compds. decompg. into aldehydes or ketones. A CH_2O soln. which is slightly acidified with H_2SO_4 or HCl may be used at temps. of 25–80°. After the treatment with the corrosive reagents, the material may be treated with oxidizing agents such as H_2O_2, permanganates, perborates or HNO_3.

Treating hat bodies of hair or wool. R. BACH. Brit. 243,317. To enhance the gloss of hats and give them a smooth finish, they are treated with aldehydes or ketones (or substances yielding these compds) and preferably subsequently treated with oxidizing agents, in a process similar to that of Brit. pat. no. 243,301 (above).

26—PAINTS, VARNISHES AND RESINS

A. H. SABIN

Luminous paints. RONNEAUX. *Génie civil* **88,** 203–6(1926).—The development of these paints and their luminous and photographic properties are discussed.
JACK J. HINMAN, JR.

The importance of particle properties in paint pigments. C. A. KLEIN. *Trans. Inst. Rubber Ind.* **2,** 73 7(1926).—A crit. survey of various aspects. C. C. DAVIS

Accelerated test of paint and other finishes. M. SCHULZ. *Farben-Ztg.* **31,** 2879–82 (1926) —(1) The films on iron are allowed to dry for 3 days at room temp and are then exposed to a temp of 80° for 24 hrs. (2) They are dipped for 4 hrs. into distd. water at 20°. (3) Ultra-violet rays are directed for 2 hrs. upon the swelled, wet films and for 2 hrs. upon the dry films. (4) The films are immersed for 2 hrs. in distd water at 20°. (5) They are exposed for 24 hrs. to a wet atm. of CO_2 and air. (6) They are then exposed to ultra-violet rays during 1 hr. in a moist state at room temp., and during another hr in a dry state at 50°. (7) During 1 hr. the films are treated with a 1% SO_2 and air mixt. (8) They are exposed to a steam-satd. atm of 35-40° for 20 hrs. During this time and at certain intervals the films are dipped into distd. water of room temp. and then cooled down to —5° for 10–15 min. (9) The treatment with ultra-violet rays, as mentioned under 3, is repeated. (10) Finally, the series of treatments 2 to 9 is repeated 6 times. The app. is described. J. S.

Standards for white and colored paints over a white undercoat. ANON. *Farben-Ztg* **31,** 2825–6(1926).—A classification of the different tests and the quant. analysis of white lead, zinc oxide and total chromate are given. J. SCHALCH

The drying of pulverized, colored pigments. F. BUSCHMANN. *Farben-Ztg.* **31,** 2721–2(1926).—The color paste is disintegrated and blown into the drying tower by means of compressed air. A counter-current of hot air effects a rapid drying of the product. The process is continuous and economical. J. SCHALCH

Paint and varnish removers and their requirements. ERICH STOCK. *Farben-Ztg.* **31,** 2829–30(1926).—The removers are classified thus: (1) Saponifying agents, such as NaOH, KOH, NH_3, or mixts., which are used preferably as paste mixed with saw-dust, starch, chalk, etc. (2) Solvent mixts. contg. wax, paraffin and oils to prevent a rapid evapn. These also are used as paste. J. SCHALCH

Mechanism of lithopone formation. C. A. MANN. *Third Colloid Symposium Monograph* **1925,** 247–9.—See *C. A.* **20,** 2756. JEROME ALEXANDER

The preparation of India ink and crayons for lithography. HANS HADERT. *Farben-Ztg.* **31,** 2776–7(1926).—H. gives the following formulas for India ink in lumps: (1) Lampblack is mixed with gum arabic or tragacanth (dissolved in water) until a stiff paste is obtained. (2) Eight to 9 parts bleached beeswax, 2 parts water-free grain soap, 2 parts orange shellac, 2.5 parts gas-black. (3) Twenty parts mutton tallow, 20 parts pure, yellow beeswax, 18 parts white grain soap, 35 parts orange shellac, 25 parts mastic, 16 parts lampblack, 2.5 parts turpentine, rectified. (4) One hun-

dred parts yellow, pure beeswax, 100 parts light grain soap, 90 parts orange shellac, 55 parts mutton tallow, 40–50 parts lampblack, 45 parts soda ash (dissolved in water). The ingredients of these formulas are well mixed and fused together at a suitable temp. Crayons are prepd. by mixing and fusing the following products: (1) Sixty-five parts yellow, pure beeswax, 25 parts light grain soap, 16 parts lampblack, 2 parts c. p. saltpeter (dissolved in 14 parts water), 20 parts oil soap. (2) Fifty-five parts yellow, pure beeswax, 35 parts orange shellac, 40 parts light grain soap, 20 parts lampblack, 10 parts mutton tallow, 5 parts soda ash (dissolved in water). The French India ink (Lemercier) consists of 2 parts yellow, pure beeswax, 1.5 parts mutton tallow, 6.5 parts white tallow soap, 3 parts shellac, 1.5 parts lampblack. J. SCHALCH

Trade names of solvents, diluents and plasticizers of the cellulose lacquer industry. C. P. v. HOEK. *Farben-Ztg.* **31,** 2885–6(1926).—The corresponding chem. names are given. J. SCHALCH

The change of refractic index of linseed oil in the process of drying and its effect on the deterioration of oil paintings. A. P. LAURIE. *Proc. Roy. Soc.* (London) **112,** 176–81(1926).—The lowering of tone of oil paintings is discussed in detail, and it is made evident that not only the yellowing of linseed oil with age, but its steadily increasing *n* are the causes. Selection of proper pigments and a method of application in which light back-grounds or undercoatings are used are suggested as rational methods of avoiding the lowering of tone with age. A. W. KENNEY

Quantitative determination of the "break" (and foots) in linseed oil. GEO. S. JAMIESON AND W. F. BAUGHMAN. *J. Oil Fat Ind.* **3,** 307–9(1926).—Weigh 10 g. of sample in a 50-cc. flask and transfer with 50 cc. gasoline, b. p. less than 80°, into a 500-cc. pear-shaped separatory funnel. Shake, add 10 cc. of 14% KOH soln. and shake for 3 min. Then add 25 cc. of 50% alc., shake 15–20 sec. and allow to stand until the mixt. seps. Draw off the lower layer and the ppt. into a 200-cc. separatory funnel. Add 20 cc. of gasoline, shake and allow to sep. Draw off the lower layer and the ppt. into a 250-cc. beaker. Add the upper layer to the main gasoline soln. in the large separatory funnel. Pour the alc. alkali soln. back into the 200-cc. funnel and ext. with 20 cc. gasoline. Repeat this treatment a 3rd time. Save the alc. alkali soln. for the detn. of the fatty acids. Wash the gasoline soln. of the oil 3 times with 15 cc. portions of 50% alc. and add the washings to the alc. alkali soln. in the 250 cc. beaker. Transfer the soln. of the oil to a weighed 300-cc. Erlenmeyer flask. Distil off as much as possible of solvent by placing the flask in a H_2O bath; then heat at 120° to 125° in an oven, using an atm. of CO_2, and weigh to const. wt. Calc. the % of neutral oil. Place the beaker contg. the alc. alkali soln. on the steam bath and evap. the alc. Then add 75 cc. H_2O and acidify with HCl. Cool until the fatty acids become solid, filter and wash. Place the funnel contg. the filter paper and fatty acids in the 250-cc. beaker and heat on the steam bath until dry. Dissolve the fatty acids with small amts. of gasoline. Collect the filtrate and washings in a weighed 200-cc. Erlenmeyer flask. Remove the solvent as described for the detn. of neutral oil and weigh. Calc. the % of fatty acids. To obtain the % of break, subtract the percentages of neutral oil and fatty acids from 100. A table of results is given. There is no relation between quantity of break in ...

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observed low content of active O_2 (1 − 3%). Polymerization in drying is quantitatively greater than autoxidation. Mol. wt. detns. are dependent upon the degree of dispersion, the concn. of soln., the character of the solvent and the nature of the substance under examn. Neutralization nos., sapon. nos., and I nos. were detd. by E. and M. for the acids from fresh linseed-oil films, boiled-oil films, wood-oil gels (sol. and insol. acids), wood oil films and Tokyol films and the conclusions are drawn that natural drying shows a different type of polymerization than is met with in boiled-oil drying; it is more complex in the latter case, due not to the formation of anhydrides or lactones but to a rearrangement within the mols. of the fatty acids of the glyceride itself. In the natural films of the fatty oils the Rast method of mol. wt. detn. shows

no intramol. autopolymerization, but this is shown in boiled oils before drying. In general the mol. wt. detn. of oil films does not lead to any evaluation of the quality of an oil. The formation of stearic acid by hydrogenation of the least dispersed portion of boiled linseed oil proves the absence of any dioxane ring. P. ESCHER

Rosin for the floor-covering industry. R. B. ROHRER. Am. Soc. Testing Materials (preprint) No. **65,** 10–5(1926).—The grades used and reasons for the choice are mentioned. The effect of dirt, the m. p., phys. and chem. consts., cryst. rosin, and interchangeable substances are discussed. Wood rosin is generally used in the linoleum industry. The properties essential to rosin for floor coverings include: (1) ability to "dissolve" linoxyn, (2) absence of water, (3) light color consistent with price, (4) freedom from dirt, (5) uniformity of m. p., (6) absence of the cryst. variety. W. H. BOYNTON

Value of a direct measurement method for particle size determination (GREEN) **30.** The influence and elimination of coarse particles (HEATON) **30.**

Pigments. DEUTSCHE GASGLÜHLICHT-AUER-GES. Brit. 242,282, Oct. 31, 1924. Pigments contg. "acid of Ti" or other pigments are rendered permanent and prevented from affecting oil with which they are afterward mixed, by neutralizing any traces of free acid adhering to the particles by addn. of (usually about 5% of) ZnO or $Zn(OH)_2$, followed by filtering, washing, drying and heating to incandescence.

Titanium pigments. C. A. KLEIN and R. S. BROWN. Brit. 243,081, Aug. 25, 1924. In producing a Ti pigment with a base of $BaSO_4$, a slag of Ba and Ti oxides contg. some Fe is obtained by fusing rutile or ilmenite with a Ba compd. such as $BaCO_3$ with or without a flux such as fluorspar and a reducing agent. After removing Fe from the slag it is formed into a paste with H_2SO_4, the resulting mixt. of Ti and Ba sulfates is run into boiling H_2O in the presence of org. substances such as aldehydes, sugar or starch which prevent pptn. of Fe. The product is washed, dried, calcined and ground.

Paint remover. W. E. SEABORN, F. C. KENT and A. W. INGALL. Can. 263,840, Aug. 24, 1926. A paint remover consists of NaOH 85 lbs., CaC_2 6 lbs., bran 20 lbs., and water 30 gals.

Coated fabrics for floor covering, etc. C. M. TAYLOR. Brit. 243,614, May 16, 1925. A felt base with a flexible filling material is coated with paint and then with a cellulose acetate or nitrate compn. Cf. *C. A.* **20,** 272.

Linoleum. G. SCHICHT and A. EISENSTEIN. Brit. 242,832, Feb. 3, 1925. In the manuf. of linoleum from materials such as oil varnish, resin, wood meal and mineral coloring agents, the raw materials are mixed together in such proportions that the resulting mass is "just pulverulent," the mixt. is oxidized and additional quantities of the ingredients are added during or subsequent to oxidation.

Coating and polishing woodwork. S. DYHR. Brit. 242,478, Jan. 8, 1925. A celluloid-rosin soln. contg. more rosin than celluloid is first applied, followed by coats contg. a larger proportion of celluloid and finishing with a coat of pure celluloid which may be finished with pumice and methylated spirits.

Composition for simultaneously polishing and staining wood or similar material. E. DE VILLIERS. Brit. 242,760, Oct. 20, 1924. Paraffin, beeswax and turpentine are mixed with umber, lampblack, red oxide of Fe or other pigment, stain or dye.

Varnish composition for use as a primer. G. RUTH AKT.-GES. AND R. WEITHÖNER. Brit. 242,379, Aug. 28, 1924. $Al(OH)_3$ (or an Al salt and an alk. compd. which together will form $Al(OH)_3$) is added to a mixt. of rosin and linseed oil or wood oil, or may be added first to a resinic or fatty acid and the product then mixed with a drying oil. Turpentine may be added as a thinner and driers such as those contg. Pb and Mn may be used.

Cellulose acetate varnishes, etc. A. EICHENGRÜN. Brit. 243,031, Nov. 17, 1924. Coating compns. for fabrics and the like comprise solns. of acetone-sol. cellulose acetate or a mixt. of acetone-sol. and $CHCl_3$-sol. cellulose acetates, formed in the cold by soln. in CH_2Cl_2 together with MeOH or its homologs as a solvent, with or without other solvent or nonsolvent substances, such as acetone, formic and acetic esters, C_6H_6, ethylene chloride and triacetin, fillers, softening agents and the like. The compns. may be applied over nitrocellulose coatings.

Resinous compositions. E. SCHAAL. Brit. 243,556, Jan. 10, 1925. Resinic acid glycerol esters and colophony are rendered hard and suitable for use as substitutes for copal in the manuf. of varnishes and like products by powdering them, mixing with dehydrating and oxidizing agents and heating them in a current of air, O or steam to

a temp. below their m. p. Co acetate, Mn borate or resinate and anhyd. Na_2SO_4 and NaCl may be used in the treatment.

Synthetic resins. J. S. STOKES. Brit. 243,470, Sept. 9, 1924. Furfural or furfuramide is used with PhOH, cresol, resorcinol or naphthol to obtain a fusible resin which is subsequently hardened by use of furfural or a CH_2-contg. hardening agent. Jet-black resins are produced without addn. of any pigment and the products may be removed hot from a mold without impairing their glossy appearance. p-$C_6H_4(NH_2)_2$ may be used to accelerate hardening. Numerous details are given.

Rosin composition. MILLS NOVELTY CO. Brit. 243,288, Aug. 20, 1925. A rosin compn. for use on the bow-disk of an electrically played violin is formed of rosin mixed with 20% or less of sandarac, with or without addn. of a small quantity of linseed oil. Alc. may be used as a solvent in mixing the ingredients and then distd. off. An app. is described adapted for prepg. the mixt.

27—FATS, FATTY OILS, WAXES AND SOAPS

E. SCHERUBEL

Polymerization during the drying and boiling of fatty oils. L. AUER. *Chem. Umschau Fette, Oele, Wachse u. Harze* **33,** 216–26(1926).—A critical review of recent literature. *Conclusions.*—Neither the mol. wt. detns., I nos., viscosity nor n are final proof for polymerization during the boiling of fatty oils or during their film formation. A final proof would be a demonstration of the presence of the 4 C atom ring and a mol. wt. detn. in a true soln. Formation of boiled oil and gelatinizing of wood oil are of a colloidal nature and are part of the phenomenon of a coagulation. The detn. of analytical consts. appears to be influenced not only by chem. structure but also by colloidal reactions. It seems improbable that a dimol. polymerization should occur in the presence of high mol. colloidal media. Many so-called polymerizations are probably a coagulation of an isocolloid of a lyophile nature. P. ESCHER

Oil bleaching experiments. R. NEU. *Z. deut. Oel- Fett-Ind.* **46,** 594(1926).—Exposure to light and boiling with solns. of salts of the Cu group plus SiO_2 bleaches soy-bean oil to a golden color, while raw linseed oil when heated with glucose to 240° and shaken with tannin soln. and pptd. with $SnCl_2$ bleaches to a light color. Derivs. of glucose do not act as well. P. ESCHER

The acetin and dichromate methods for glycerol analysis. W. PRAGER. *Z. deut. Oel- Fett-Ind.* **46,** 577–8(1926).—Comparative tests in glycerol analysis between the acetin and dichromate methods for a number of years show results that agree within less than 1.4%, only a few cases differing by more than 2%. The dichromate method gave the higher results. The cause of variations lies in the fact that in the dichromate method the glycerol is purified before analysis while in the acetin method it is not. The dichromate method also provides for a modified procedure when the total residue reaches a certain arbitrarily set limit. P. ESCHER

The fluorescence of oils in ultra-violet light. FRITZ CRONER. *Z. angew. Chem.* 39, 1032(1926).—A special Hg lamp is used which retains the rays visible to the eye and allows nearly pure ultra-violet rays to penetrate. Various vegetable and mineral oils were examd. and the following conclusions reached: (1) The various oils when placed in open dishes in the ultra-violet light show a characteristic fluorescence at the surface and a characteristic coloration of the oil itself. (2) A dark blue fluorescence on the surface indicates heating over 150° or (3) a mixt. of vegetable or animal oil with mineral oil. (4) An unclear color mixt. indicates a mixt. of various vegetable or animal oils. E. SCHERUBEL

Isopropanol as a substitute for ethanol. I. The determination of saponification numbers. H. A. SCHUETTE AND L. E. HARRIS. *J. Am. Pharm. Assoc.* **15,** 166–73 (1926).—Com. isopropanol was purified by distn., the fraction b. 81.3° (uncor.) being reserved. Solns. of KOH were made with purified EtOH and isopropanol as solvents. The sapon. nos. of 9 oils and waxes were detd. by the A. O. A. C. method, each KOH soln. being used. The values with propanol as solvent were substantially the same as those with EtOH. The advantages of using propanol in detg. sapon. nos. are the rapidity of sapon., freedom from aldehydes and the lack of legal restrictions in its sale. A glycerol-KOH soln. was prepd. by the A. O. A. C. method and a satd. soln. of KOH in propanol. Nine fats and oils were sapond. by each KOH soln. and the fatty acids sepd. and washed. The I no., m. p. and n_D of the fatty acids from each sample were detd. These consts. were essentially alike for each of the classes of oils. The general

conclusion is that isopropanol may be used as a solvent in place of EtOH for the prepn. of propanol-KOH. L. E. Warren

The lactone number. C. Stiepel. *Seifensieder-Ztg.* **53,** 617–8(1926).—Since the acetyl no. of fats and oils shows not only the OH groups of fatty acids, but also those of alcs. or uni- and diglycerides that might be present, the following method for the detn. of the "lactone-number" is proposed in its place, to indicate the presence of OH groups in fatty acids by the formation of inner anhydrides through loss of H_2O, thereby decreasing the acid no. but retaining the sapon. no.: Prepare the dry, free fatty acids of the sample by sapon. and acidification and det. the acid no. and sapon. no. to show complete sapon. Heat in a suitable flask to 250° for 2 hrs. and after cooling again det. the acid and sapon. nos. As a control heat again for 1 hr. to 250° and det. the acid and sapon. nos. to ensure completed lactone formation as shown by the constancy of these nos. The difference between the acid no. and sapon. no , divided by 2, gives the approx. amt. of lactones forming fatty acids contg. OH groups Results are also given of expts. in which the fatty acids had been re formed from these lactones by sapon. P. E.

Detection of hardened oils. J. Davidsohn and C. Streichhan. *Seifensieder-Ztg.* **53,** 551–3(1926).—D. and S detect hardened oils by Grun's method: Liberate the fatty acids from 2–5 g. of the fat, dissolve in hot 96% alc. and treat with a hot 96% alc. soln. of 1.5 g. Pb acetate Cool overnight and ascertain the presence of an excess of Pb soln. by adding some dil. H_2SO_4. Filter and wash with alc. until the filtrate remains clear when H_2O is added. Return the ppt into a flask with 100 cc alc., add 0 5 cc. glacial AcOH and boil. Cool to 15°, wash, crystallize the Pb soaps with alc and return again to the flask, washing with ether. Decompose the Pb soaps with dil. HNO_3 and ext. the fatty acids with ether Det their I no by the Hanus method. Tallows will show an I no. of 0.5, while hardened oils will show around 33 5 I no caused by the formation during hardening of solid isooleic acid. Attempts to shorten the method have failed. P. Escher

Stability of sulfonated oils toward acid, lime and magnesia. H. Pomeranz. *Seifensieder-Ztg.* **53,** 589(1926).—P. proposes the following criteria: For acid stability the soly. in dil. acids; for lime stability the formation of a compact soap that sinks to the bottom; for Mg stability the soly. of Mg soap in H_2O. P. Escher

Cajeput oil. D. B. Spoelstra. *Ber. Afdeel. Handelsmuseum Ver. Koloniaal Inst.* No. **25,** 3–8(1926).—Complaints have come in about cajeput oil having a low d., which causes difficulty in its sale. According to the literature, this is a normal variation, and no proof of an adulterated oil. A large no. of cajeput oils have been analyzed by S., especially with regard to the cineole content. For the last named the method of Schimmel was used. Petroleum and fats are used as adulterants, and can be easily detected. The soly. in 80% alc. is a good indication of a pure oil. It may be possible, with the help of this test, to eliminate the heaviest adulterated oils from the market. Tabulated results of analyses are given. J. C. Jurrjens

Deodorization of coconut oil. W. L. Brooke. *Philippine J. Sci.* **30,** 201–12 (1926).—Methyl nonyl ketone was isolated from the product obtained from the deodorization of coconut oil, thus confirming the finding of Haller and Lassieur. Its presence is established by the prepn. and identification of the oxime, dioxime and semicarbazone. Most of the unsapon. substances distil over in the first 4 hrs. of deodorization. The deodorization sludge from the factory analyzed as follows: moisture 20.25, lauric acid 26.3, ash 3.26%, sapon. no. 79.0. The unsapon. constituents also contain alc. compds. E. Scherubel

Identification of olive oils obtained by extraction with solvents. Stefano Pachini. *Giorn. chim. ind. applicata* **8,** 178–9(1926).—Olive oils obtained with solvents, and refined extn. oils, are easily identified even when present in small amts. in pressure olive oils, by means of the following reaction: Treat 2.–3 cc. of the oil in a test tube with an equal vol. of Ac_2O, heat and shake for a little while, cool and filter through a small filter moistened with Ac_2O. To the filtrate in a small porcelain dish add a few drops of concd. H_2SO_4: a cherry-red color soon develops. If a few cc. of H_2O are added to the product of the reaction, the liquid takes on a more or less intense green color, which, however, soon disappears. All olive oils ordinarily obtained from olive husks by extn. with solvents give the above color reaction. The reaction is still present in refined extn. oils and takes place even more clearly, because of the absence of chlorophyll and other disturbing impurities. This reaction permits differentiating between olive oils obtained by extn. with solvents from those obtained by pressure and from clear olive oils. Saccardi's test for sulfur oils (cf. *C. A.* **20,** 3243) generally gives negative results when applied to oils obtained from olive husks with CS_2. R. S. P.

The composition of the drying oils and their relations to the primary and secondary

umber. W. VAUBEL. *Farben-Ztg.* **31,** 2771–5(1926).—The primary ', from the amt. of Br directly absorbed by the oil. It corresponds inoleic and linolenic acid and their isomers. The linoleic acid can of the hexabromine number. The secondary Br number is calcd. of Br absorbed when used in excess. The difference between lary Br (I) numbers corresponds to the amt. of oleic acid present ~ oil. The iso- or β-linoleic acid reacts like oleic acid after the addition of 2 Br mols. The drying oils constantly change their constitution, whereby the Br (I) no. diminishes. Therefore the highest Br (I) no. ever found corresponds to the original character of the oil. V. reviews the composition and the I numbers of the following oils and compares his own figures with the figures found by others: sunflower, soy bean, poppy, rape, hemp, peanut, walnut, linseed, wood, whale and sardine oil. J. S.

Determination of fatty acids for customs purposes. H. HELLER. *Z. deut. Oel-Fett-Ind.* **46,** 148(1926).—The Czechoslovakia customs regulations give the following rapid method for detg. whether a fat contains more or less than 50% free fatty acids: Heat 5 g. of the sample with 50 cc. alc. until dissolved; cool, add a few drops of phenolphthalein and 5 cc. KOH soln. (65.45 g. per l.). If the soln. remains red after 15 sec., less than 50% free acids are present; if colorless, more than 50% are present. A calcn. on the above basis reveals the error that the 5-cc KOH soln. is equal to only 32.7% instead of 50% free acids as oleic acid. A corresponding change should be made in the directions to insure correct customs decisions. P. ESCHER

Synthesis of waxes. AD. GRÜN. *Z. angew. Chem.* **39,** 1037(1926).—The hydrogenation of ketones by the use of Ni catalyzers to form secondary alcs. yields hydrocarbons also. It has been found that the use of other metals than Ni and metal mixts. will give yields of 80–90% of the theoretical wax alcs. The elementary analysis of the substances are correct only if the substances are burned with CuO in a stream of O. The usual procedure gives results too low for C and H and ethylene is lost. By placing an absorption flask at the end of the app. contg. 0.05 *N* ICl in AcOH and titrating back with thiosulfate over 1% C_2H_4 was found. High mol. hydrocarbons and their O derivs split off O and olefins by heating under certain conditions. It is questionable whether a slight cracking is a source of error in the elementary analysis of high mol. substances. E. SCHERUBEL

The swelling constants of soaps. E. L. LEDERER. *Z. deut. Oel- Fett-Ind.* **46,** 497–9; *Seifensieder Ztg.* **53,** 534–6; *Z. angew. Chem.* **39,** 1007–9(1926).—Katz's formula for the relation between swelling pressure and swelling heat, $M_0dQ/Mdx = P_q = -(RT/M)\log_e h$, in which *R* is the gas const., *T* the abs. temp., *M* the mol. wt. of the liquid medium and M_0 the mol. wt. of the swelling substance, was applied to soaps in H_2O. The exptl. results agree only qual. with the calcd. results; the quant. figures vary on account of their small values. These small values leave also unexplained L.'s observation that soaps of various H_2O content, when mixed in bulk, may heat up to carbonizing. L. also calcd. the values for his "permanation" const. *viz*, that amt of H_2O which passes in unit time through a unit cross section per unit of length at a concn. difference of 1. This value is not proportional to the abs. temp. as required by theory, but is rather proportional to the centigrade temp., probably because of the cessation of mobility of the H_2O mols. at 0°. The permanation const. varies also with the speed of solidification of the soap. P. ESCHER

Problems in the soap industry, especially saponification in the autoclave. J. GROSSER. *Seifensieder Ztg.* **53,** 588, 602–3(1926).—A discussion of the advantages and disadvantages of boiling soap under pressure. The disadvantages predominate. P. ESCHER

Washing compounds containing sodium silicate. W. KIND. *Seifensieder Ztg.* **53,** 618–9, 633–4(1926).—The use of condensed H_2O in boiling and rinsing wash goods caused no fiber incrustation, the ash after 20 washings showing 0.12%, of which 0.08% is SiO_2, while tap H_2O of 12° hardness (German) showed 2.73% ash (0.23%, SiO_2) under the same treatment. P. ESCHER

The determination of borates in soaps. M. DITTMER. *Seifensieder Ztg.* **53,** 633 (1926).—An explanation is given for the calcn. of results in the method adopted as standard by the German Commission for Standard Methods (cf. *C. A.* **18,** 3731). P. ESCHER

The "alkali number" as a conventional method for the alkalinity of soaps. V. ISMAILSKII. *Z. deut. Oel- Fett-Ind.* **46,** 545–6, 562–4(1926).—Expts. on the detn. of free alkali in soaps lead to the following conclusions: The use of 50–60% alc. (Bosshard-Huggenberg method) causes Ba soaps to absorb varying amts. of alkali from different soaps, α-naphtholphthalein for dark soaps is not a better indicator than phenol-

phthalein; pptn. in the cold in the presence of silicates favors absorption of alkali; the exact detn. of free alkali in soaps is still an unsolved problem. After detg. the factors that cause variations in the results, such as concn., temp., amt. of washing, etc., I. proposes the following standard method of detg. the "alkali number:" Weigh up to 10 g. of the sample, freshly cut from the center, into a 400 cc. rubber-stoppered flask and dissolve in 20 times the wt. of boiled out H_2O; ppt. with twice the wt. of neutralized 30% $BaCl_2$ soln., rotating the flask; boil until the ppt. coagulates or, if soda or silicate is present, until it granulates, keeping the flask loosely stoppered up to this point. Cork tightly and cool under H_2O, opening once to relieve suction. Filter through a rapid filter into an Erlenmeyer flask and wash the ppt. still retained in the flask 3 times with a total of 10 times the wt. of cold H_2O. Titrate against 0.1 *N* acid and phenolphthalein; express the results in % NaOH. Examples of the constancy of results are tabulated for different soaps. Eschweger soaps show variable results on account of the difference in compn. of their marbled structure. A qual. test for alky. has also been worked out by I. and is described. The sensitiveness of the human skin toward alk. soaps is caused by the absorption of the alkali by the skin, followed by hydrolysis of its albumin. P. ESCHER

How I have been led to the direct hydrogenation method by metallic catalysts (SABATIER) 2.

Purifying oils and fats. METALLBANK UND METALLURGISCHE GES. AKT.-GES. and W. GENSECKE. Brit. 242,739, Sept. 17, 1924. In purifying oils or fats with steam *in vacuo* as described in Brit. pat. No. 222,093 (*C. A.* **19,** 1062), the steam and vapors from the extg. vessel are transferred by a steam injector which causes them to expand to an abs. pressure lower than that prevailing in the extg. vessel before their delivery to the mixing venturi of the injector. Other structural details are also specified. Cf. *C. A.* **19,** 3168.

Purifying vegetable oils. H. BOLLMANN. Brit. 243,643, May 15, 1925. Soybean oil or other vegetable oils are freed from phosphatides by treatment with an aq. soln. of $Ba(OH)_2$, which prevents the formation of an emulsion when the oil is subsequently treated with alc. to remove fatty acids.

Butternut oil. A. P. ELIADES. U. S. 1,602,004, Oct. 5. Whole butternut meats are soaked in brine, the brine is drained off and the nutmeats are roasted until they attain a rich brown color, comminuted, mixed with previously extd. butternut oil and H_2O and the mixt. is cooked to a pulp at its b. p., free oil is drained from the pulp and residual oil is pressed out of the pulp. The product is suitable for use on the scalp as a *therapeutic agent.*

Distilling apparatus for refining oils or fats. LEVER BROS., LTD., R. CRAIG AND C. E. C. SHAWFIELD. Brit. 242,316, May 9, 1924. An app. is described suitable for use in carrying out the process of oil- or fat-refining specified in Brit. pat. 224,928 (*C. A.* **19,** 1918).

Edible fat. H. A. NEWTON. U. S. 1,601,229, Sept. 28. Onions are cooked to a browned crisp condition in a vegetable fat such as peanut, cottonseed or soy-bean oil, mixed with hydrogenated cottonseed oil to form a product resembling chicken fat which has been rendered with onions.

Apparatus for sweating and crystallizing wax. BURMAH OIL CO., LTD., H. L. ALLEN and J. MOORE. Brit. 243,447, Aug. 29, 1924. Modifications of the app. described in Brit. pat. No. 208,195 are specified.

Soap. K. HAAS. Brit. 243,423, Aug. 22, 1924. In the sapon. of albumin and fats with excess alkali, the partial dissocn. of the proteins is interrupted by the addn. of CH_2O, paraformaldehyde or $(CH_2O)_3$ so that $(CH_2)_6N_4$ is formed and hardening of the soap is effected. Excess alkali is neutralized by freshly pptd. hydroxide of Al, Sn or Zn or by benzoic, formic or other org. acid. At least 15% of proteins is used.

Soap. W. SAECHTLING. Brit. 243,333, Nov. 24, 1924. Curd soap is bleached and refined after salting out by treating it first with a bleaching agent, such as a hyposulfite, having a reducing action, and then with another bleaching agent, such as a percarbonate or persulfate, having an oxidizing action.

Solid alcohol soap. R. FALCK. U. S. 1,601,224, Sept. 28. Brit. 242,444, Nov. 17, 1924. Soap almost completely freed from H_2O is heated with about 1.2 times its weight of strong alc. in a closed vessel at a temp. of 120° under a pressure of 6 atms. for $1^1/_2$ hrs.

28—SUGAR, STARCH AND GUMS

F. W. ZERBAN

Possible sugar loss in the pipe lines of slicing factories. P. MORIZOT. *Bull. assoc. chim. sucr. dist.* **43,** 83–5(1925).—Beet juice which had been limed at the rate of 10 g. of CaO per l. and had a sugar content of 12.51% (av. of 96 polarizations) was found on arrival at the central factory to contain 12.59% (av. of 48 polarizations), showing that the amt. of CaO stated suffices to conserve the juice during its normal transport in pipe lines. J. F. BREWSTER

Solubility of sucrose in impure solutions. J. ROBART. *Bull. assoc. chim. sucr. dist.* **43,** 128–32(1925).—With beet molasses contg. very melassigenic non-sugars, results were obtained showing that the soly. of sucrose is not affected by the presence of such substances. J. F. BREWSTER

Purifying molasses by addition of hydrochloric acid. G. DORFMÜLLER AND F. TÖDT. *Z. Ver. deut. Zuckerind.* **75,** 903–13(1925).—Addn. of HCl to molasses to neutralize the bases present and to obtain a more readily worked product, effects no actual increase in the purity value. If the soln. of molasses is dialyzed after the HCl addn., as in Cutler's method (*C. A.* **18,** 2084, 2821), the economy of the process becomes extremely doubtful. J. F. BREWSTER

Has the double crusher reason for its existence? FRANCIS MAXWELL. *Intern. Sugar J.* **28,** 357–63(1926).—The crusher should be regarded as a preparatory stage to milling, and to accomplish its purpose the cane must be torn into shreds. If this is not done, the 1st and sometimes even the 2nd mill must continue this preparatory work. It is sometimes claimed that extn. is increased by double crushing, but the expression of the juice from the cane should be done by the mill and not by the preparatory plant. The claim that double crushing is indispensable for capacity of milling, may be adequately answered by the record established at Central Vertientes in Cuba, of 5600 tons in 24 hrs., with a single crusher, followed by seven mills. W. L. OWEN

Fermentation of bagasse in relation to the yields of industrial alcohol. WM. L. OWEN AND NORMAN BENNETT. *Intern. Sugar. J.* **28,** 463–70(1926).—The rapidly increasing utilization of cane bagasse for the manuf. of fiber board, "Celotex," and the necessity of storing the baled bagasse as a reserve supply during the yr., have introduced a problem of preserving this material from deterioration in storage. Since the residual sugars in the bagasse tend to hasten its deterioration, their removal by fermentation into alc. might prove economically feasible. The sugars in baled bagasse did not ferment very readily, and the addn. of the bagasse to a molasses wort tended to depress the yield of alc. and to lower the efficiency of the fermentation of the sugars in the molasses. However, a bagasse which was first extd. with H_2O and then treated with a sugar soln. comparable in compn. to a cane juice, did not depress the yield of alc. from a molasses wort, and the overall efficiency of the mixt. of bagasse and molasses soln. was practically as good as on the molasses alone. This indicates that with fresh bagasse satisfactory yields of alc. could be obtained. W. L. OWEN

Effect of boiling on color. F. HOFFMANN. *Sugar* **28,** 266–8(1926).—The increase in color from thick juice to run-off was studied. Measurements were made in a polarization photometer with a double blue filter. Boiling caused an increase in color, averaging 47%. C. H. CHRISTMAN

Rational regulation of the boiling house. L. W. HOFLAND. *Arch. Suikerind.* **34,** 697–705(1926).—The boiling scheme proposed by Van Nes (*C. A.* **20,** 3915) is criticized. A scheme based on former recommendations (*C. A.* **16,** 1516) is outlined, and this is claimed to be superior to Van Nes' both from the standpoint of the removal of nonsugars and that of the time during which the products are exposed to high temp. F. W. ZERBAN

Exhaustive graining of sirup by drawing in a series of run-offs of gradually descending purity. G. E. VAN NES. *Arch. Suikerind.* **34,** 706–7(1926).—Reply to Hofland (cf. preceding abstr.) refuting his arguments. F. W. ZERBAN

Reconditioning damaged sugar. C. W. LADD. *Sugar* **28,** 307–9(1926).—A warehouse contg. granulated sugar burned. A portion of the sugar was not damaged. The balance was dissolved, limed with 10% lime and carbonated. After filtration it was sulfured and sent through the effects. It was sulfured again and filtered and then sent to the pan. The total cost per bag was $0.684. C. H. CHRISTMAN

The chemistry of refining by "Norit." P. HONIG. *Intern. Sugar J.* **28,** 302–6 (1926).—One of the most significant results of the "Norit" treatment of sugar melts from washed Cuban sugars, is the increase of the surface tension of the liquor. Fil-

tration with Filter-Cel slightly increases the surface tension, while Norit not only removes color, but greatly increases the surface tension of the filtrate. The colloids depressing surface tension are the greatest source of trouble to the refiners, because they not only interfere with crystn., but are indirectly melassigenic. The surface-tension measurements were made with a DeNouys app., with the liquor diluted to 30 Brix. Pure sucrose at 20° gave 74.75 dyn./cm. while H_2O gave 72.65. Norit-treated washed sugar melt gave 72.74. W. L. OWEN

Refining qualities of raw sugars. T. B. WAYNE. *Planter and Sugar Mfr.* **77,** 247–50(1926); cf. *C. A.* **19,** 3610.—The nature of the soil influences the quality of the sugar in Cuba. Clarification practice varies in different centrals and the resulting sugar may contain colloids which reduce refining yields. Gums and non-settling matter reduce filtration rates. Uniform crystals facilitate affination and reduce losses from yeast, bacteria and fungi. Moisture should be low. Factors other than polarization should be standardized in the grading of sugars, giving high-grade sugars a premium and low-grade sugars a penalty. C. H. CHRISTMAN

Decolorizing carbons: their value in sugar refining. A reply to Suchar Process Corporation. A. A. BLOWSKI AND J. H. BON. *Intern. Sugar J.* **28,** 367–70(1926).—A reply to Wickenden (*C. A.* **20,** 1336). W. L. OWEN

Standardization of Louisiana cane products. I. H. MORSE. *Planter and Sugar Mfr.* **77,** 188–90(1926).—Specialization upon the production of a uniform grade of sirup is urged as being the solution of low returns from Louisiana cane. A demand for high-grade sirup exists and its production would increase the returns to the factory. C. H. CHRISTMAN

Some analytical studies on sugar cane grown in Florida. J. McW. LEMON. *Planter and Sugar Mfr.* **77,** 167–70(1926).—D 74 and Crystalina cane were analyzed at intervals from Sept. 19 to Feb. 6. D 74 shows a higher sucrose and reducing-sugar content throughout the test. C. H. CHRISTMAN

A study of cane burning before cutting. C. ALINCASTRE. *Sugar News* **7,** 272–85 (1926).—Burned uncut cane suffers losses similar to cut cane. Purities in burned cane drop at the same rate as in cut cane. Losses occur after 24 hrs. which offset the decreased harvesting cost. Rupture of the rind permits loss of sap and decompn. by microorganisms. Burning is warranted only when harvesting costs are excessive, or when immediate milling is possible. C. H. CHRISTMAN

Experiments with sugar canes on the estates of the Ste. Madeleine Sugar Co., Ltd. G. A. JONES. *Intern. Sugar. J.* **28,** 291–6(1926).—The purpose of these expts. was to det. the variety of cane best suited to the various types of soils in Trinidad. On the brown and red soils only the Uba canes give satisfactory ratoons. On the black soils the plant canes give larger returns than the 1st ratoons, but on the alluvial soils the latter approach the former in yield. The Uba cane is gaining in favor for use on poor lands, as a means of bringing them into such a condition that other varieties may be grown upon them. In manurial expts. 20 tons of pen manure per acre gives an increase of 7.8 tons of cane, or 23.7%, which is more than 9 times the error of the difference, and hence is statistically significant. As the manure is worth 8–10 shillings per ton, and the increase in cane from 5–7 £, the manure does not pay for itself on the plant cane. W. L. OWEN

The determination of the hydrogen-ion concentration in the cane-sugar industry. LOUIS BAISSAC. Mauritius, *Bull.* No. 10; *Intern Sugar J.* **28,** 370–4(1926); cf. *C. A.* **20,** 2258.—The various methods of p_H detn. are discussed and the practical application of such detns. to cane-juice clarification is described. The range of p_H between the danger point of inversion, and of reducing-sugar destruction, is very narrow, especially where the soln. is of low sp. gr. and where it is subjected to high temps. By p_H detns. at successive stages of sugar manuf., both of these dangers may be avoided. W. L. OWEN

Juice from the time it leaves the milling plant until it reaches the evaporator supply. J. N. S. WILLIAMS. *Planter and Sugar Mfr.* **77,** 207–8(1926).—Juice after leaving the mills is screened, limed, heated and passed through intermittent settlers. The Petree process reintroduced continuous settling. p_H control at the liming station has standardized this step. Greater removal of material causing turbidity and color is required and this will be followed by lower molasses yields. C. H. CHRISTMAN

The p_H with quinhydrone electrode. L. E. DAWSON. *Sugar* **28,** 211–4, 262–4, 310–2(1926).—This method has the advantage of giving correct readings, without delay for equil. in the H^+ electrode. With care it can be used in solns. up to p_H 9.0. In solns. with low buffer effect, results may be incorrect. High salt concns. introduce errors. Strong oxidizing and reducing agents cause unreliable results. Reference

should be made to the original article for description of electrode and operating conditions. A calomel cell, quinhydrone electrode or soln. of known p_H is used as a reference. Various factors affect the p_H detn. Diln. causes an appreciable change. In clarified juice this may be small but in heavy juice, where inversion may be greater, the effect of diln. is greater. SO_2 causes errors which cannot be avoided unless the SO_2 is removed. High-purity juices have low buffer action and are susceptible to the effect of CO_2. A complete bibliography is given. C. H. CHRISTMAN

Occurrence of gentiobiose in the products of the commercial hydrolysis of corn starch. HENRY BERLIN. *J. Am. Chem. Sci.* **48,** 2627–30(1926).—Gentiobiose has been identified through the isolation of its β-octaacetate in pure, cryst. form, as 1 of the constituents of the mother liquor ("hydrol") obtained in the com. manuf. of cryst. *d*-glucose. By a comparison of phys. and chem. properties, it is shown that the unfermentable part of hydrol, while closely resembling isomaltose, contains only a comparatively small amt. of gentiobiose (5–6%) and criticism is therefore made of applying the name isomaltose to a product that apparently consists of a mixt. of carbohydrates. C. J. WEST

The hydrolysis of starch by acids. D. R. NANJI AND ROBT. G. L. BEAZELEY. *J. Soc. Chem. Ind.* **45,** 215 9T(1926).—P apparently plays an important role in the acid hydrolysis of starch. The complicated nature of the hydrolysis is emphasized and diagrams showing the numerous steps in the hydrolysis of both amylose and amylopectin are given The difficulty of studying the hydrolysis is further increased by the lack of an entirely satisfactory method of analysis. The authors developed a *method for detg. dextrin, isomaltose, maltose and dextrose* and compared the results so obtained with those by Allen's and Ling's methods. A. W. KENNEY

The effect of progressive doses of Chile saltpeter on the sugar beet (SOUČEK) **15.**

29—LEATHER AND GLUE

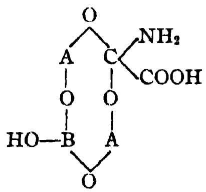
ALLEN ROGERS

The strugglings and strivings of science in the industries, with particular reference to chemistry in the leather industry. ETTORE ANDREIS. *Gerber* **52,** 85 *et seq.* (1926).—An address, dealing chiefly with the early development of leather chemistry. H. B. MERRILL

Recent advances in the chemistry of leather manufacture. DONALD BURTON. *Leather Trades Year Book* **1926,** 41–9.—A review. H. B. MERRILL

Heat economy in the leather industry. CHR. EBERLE. *Collegium* **1926,** 342–9.—Heat requirements for power, heating and leather drying are discussed. I. D. C.

Biochemical problems in leather manufacture. V. SADIKOV. *Westnik, Bote des Allrussischen Ledersyndikates* **1926,** No. $^2/_3$; *Collegium* **1926,** 356–63.—A lecture. X-ray measurements of collagen crystals indicate that it has a mol. wt. of 685. Its structure, from Dakins results, is probably



, where A is an anhydride of cycloglycylalanine, B of cycloprolyl- (or oxyprolyl)-leucine and C cycloasparagylarginine (or lysine). The —CO—NH— or C(—OH)=N group is absent (ninhydrin test). During gelatinization collagen loses its cryst. structure and the mol. becomes more complex because of hydration and condensation. From pancreatin "collagenase" can be prepd. and this will break up collagen and vegetable- or chrome-tanned leather to amino acids. Enzyme action may produce a condensed, resistant form of collagen which retains the micellar structure and which is not acted on by collagenase or pepsin prepns. I. D. C.

Finishes and the modern finishing of leather. MARCEL GILLET. *Cuir tech.* **15,** 114–6(1926).—Discussion. H. B. MERRILL

A leather industry in Spain. M. A. R. PANIKER. *Leather Trades Year Book*

1926, 60–79.—A very full discussion of methods employed in primitive and modern tanneries in Spain. H. B. Merrill

Action of acids on leather. A. Deforge. *Halle aux cuirs* **1926,** 267–71.—A review of recently published work. H. B. Merrill

The role of oxidation in leather manufacture. W. R. Atkin and F. C. Thompson. *Leather Trades Year Book* **1926,** 56–8.—It has been shown that sulfides used in *unhairing* attack the keratin mol. at the cystine group. The reaction is presumably a reduction to cysteine. It is suggested that the cysteine then acts as an O_2 carrier, being oxidized by atm. O_2 and in turn oxidizing the cells of the epidermis, thus facilitating unhairing. The *rotting of leather* is considered more a matter of oxidation than of acid hydrolysis. The leathers which deteriorate most frequently contain either Fe or catechol tannins, both of which are O_2 carriers. H. B. Merrill

Oils and fats for leather use. S. Salm. *Ledertech. Rundschau* **18,** 182–3(1926). I. D. Clarke

Technical standards (averages) in the manufacture of sole leather. A. M. Goldenberg. *Collegium* **1926,** 364–74; cf. *C. A.* **20,** 1534.—Tables are given showing the relation to each other of the fresh hide wt., green salted wt., soak wt., white wt. and the wt. of leather. The data are based on several hundred thousand hides. I. D. C.

Hide and leather defects and their causes. R. Lauffmann. *Ledertech. Rundschau* **18,** 47–52, 62–7, 75–9, 86–91, 104–6, 110–3, 126–7, 135–8, 151–3, 161–3, 170–4, 183–5 (1926).—An alphabetical list of defects is given with definitions, etc. I. D. C.

Extraction of chromium from leather by means of sodium potassium tartrate. II. Nikolaj Ivanovic Berestovoj and Liboslav Masner. *Cuir tech.* **15,** 398–400(1926); cf. *C. A.* **19,** 3385.—To supplement previous work on extn. of Cr by Na K tartrate, the extn. by acids and alkalies was studied. Removal of Cr from leather appears to be at a min. at and near the isoelec. point. H. B. Merrill

Cause of "gulf" disease. Pietro Biginelli. *Giorn. chim. ind. applicata* **7,** 568–71(1925).—In the putrefaction of the putrid waters used in freshening arsenical skins there is developed, together with NH_3, CO_2 and H_2S, also AsH_3, or more probably an org. sulfoarsine. The waters of the Danzig Gulf, especially where they receive the refuse waters from the cellulose factories nearby, approximate qualitatively to the waters resulting from freshening arsenical skins. The cause of the poisoning of workers in French tanneries, as well as of the fishermen in the Danzig Gulf, is probably attributable to the slow and relatively continuous absorption of AsH_3 or org. sulfoarsine. Robert S. Posmontier

Different leather varnishes. Hans Hadert. *Ledertech. Rundschau* **18,** 169 (1926).—Formulas are given for varnishes of various colors. I. D. Clarke

The chemist at the tannery. Boris Monsaroff. *Canadian Colorist & Textile Processor* **6,** 242–3, 266–7, 276(1926).—A non-technical discussion of the role of the chemist in the tanning industry. Chas. E. Mullin

Mechanism of chrome tanning. S. Hilpert and E. Schlumberger. *Collegium* **1926,** 349–55.—See *C. A.* **20,** 3245. H. G.

Chemical nature of vegetable tanning. A. W. Thomas. *J. Am. Leather Chem. Assoc.* **21,** 487–516(1926).—Review of the modern work on chemistry of the proteins and tannins and on the combination of tannin with collagen and deaminized collagen, showing that the combination is chemical in nature and indicating certain fundamental principles in tanning practice. J. A. Wilson

Physical and chemical properties of vegetable-tanned insole bellies. V. Wear resistance. D. Woodroffe. *J. Intern. Soc. Leather Trades Chem.* **10,** 266–72(1926); cf. *C. A.* **19,** 2143.—In general an increasing degree of tannage indicates a decreasing resistance to wear, which is also a function of the water-sol. content of the leather, a max. resistance occurring with a water-sol. content of 18 to 24%. J. A. Wilson

New tanning and auxiliary materials for the leather industry. Leopold Pollak. *Ledertech. Rundschau* **18,** 179–82(1926).—A description of artificial bates, syntans, etc. I. D. C.

What role will be played by colloidal grinders in the preparation of vegetable tanning materials for the tanning of skins? U. J. Thuau. *J. Intern. Soc. Leather Trades Chem.* **10,** 258–63(1926).—See *C. A.* **20,** 3095. H. B. Merrill

Micro-tannology. F. O'Flaherty, *et al.* *J. Am. Leather Chem. Assoc.* **21,** 516–9 (1926); cf. *C. A.* **20,** 2761.—Discussion. J. A. Wilson

Lime for the tannery. Dohogne. *Bourse aux cuirs de Liege* **1925;** *Cuir tech.* **15,** 416–7(1926).—The best results are obtained with a "fat" lime contg. 90–95% CaO. Methods of analysis are given. To prevent carbonation, the lime should be slaked

in a suitable tank as soon as received. A crust forms on the resulting paste, preventing further carbonation. H. B. MERRILL

The application of filtered ultra-violet light for the identification and differentiation of artificial and natural tanning materials. O. GERNGROSS, N. BAN AND G. SANDOR. *Z. angew. Chem.* **39,** 1028–32(1926).—Analytical aspects previously reported (*C. A.* **20,** 517, 1535) are reviewed. The work of Meunier (*C. A.* **19,** 2758, 3034) on the fluorescence of cellulose dipped in solns. of tanning materials is repeated and somewhat extended. The fluorescing substance of pine, larch and maletto occurs in the living bark, from which it is easily extd. by cold H_2O or warm EtOH or $(CH_3)_2CO$. The substance is irreversibly absorbed by cellulose in acid or neutral soln.; it is extd. from the cellulose by alkali. It is believed to be a deriv. of fisetin. H. B. MERRILL

Reducing agents used in the tannery. L. CREUX. *Cuir tech.* **15,** 397-8(1926).—Description of the manuf. of sulfites and related compds. H. B. MERRILL

The determination of the degree of tannage by means of the "hot-water test." The influence of drying on the hot-water resistance of hide powder. OTTO GERNGROSS AND REINHOLD GORGES. *Collegium* **1926,** 391–7.—The water resistance, *WB*, is detd. by heating, for 7 hrs. in a boiling H_2O bath, an amt. of leather contg. 1 g. dry hide substance with 80 cc. H_2O in a 100 cc. flask. Stirring may be continuous or 15 min. per hr. A stirring device is described. After 7 hrs. the soln. is made up to 100 cc. with boiling water, and filtered through linen. N is detd. in the filtrate and calcd. to hide substance. WB = undissolved hide substance × 100 hide substance in untreated leather. The *WB* of hide powder was raised from 2 to 7 by soaking at p_H 6, then air drying, while on drying 24 hrs. at 110° it was raised to 41. I. D. C.

Quantitative study of the influence of hydrogen-ion concentration and of neutral salts on the intensity of formaldehyde tanning. OTTO GERNGROSS AND REINHOLD GORGES. *Collegium* **1926,** 398–407.—Hide powder was tanned in 0.95% HCHO solns. adjusted to different H-ion concns The *WB* (cf. preceding abstr.) of the tanned powder increased gradually from 10 to 30 as the p_H rose from 3 to 6; it then rose abruptly to 70, at p_H 6 to 7; and was const. at 80 from p_H 8 to 12. There was no break at the isoelec. point In the acid region 0.75 satd. NaCl soln. did not change the tanning intensity or *WB*, but in the alk. region, 0.75 satd. NaCl, *N* and 0.1 *N* KCNS solns. decreased the *WB* appreciably. In concd. NaCl solns., sheep skins were not tanned in the acid but were well tanned in the alk. region. Poor leather is produced in strongly alk solns because of swelling and case hardening and not because of decreased combination of collagen and HCHO. Egg yolk, which greatly improves HCHO-tanned sheep skin, does not change the *WB*. I. D. CLARKE

X-ray spectrographic investigations of the heat contraction (so-called "Schnurren") of untanned and formaldehyde-tanned tendons. O. GERNGROSS AND J. R. KATZ. *Kolloidchem. Beihefte* **23,** 368–76(1926).—Untanned tendons shorten and swell at 67–68° and on subsequent cooling regain part of their former length. Formaldehyde-tanned fibers require at least 85°, contract less and show a greater expansion on cooling. Chrome-tanned fibers do not show these phenomena. X-ray spectrograms of the shrunken tendons (both untanned and formaldehyde-tanned) show the typical diagram for unexpanded gelatin, and on expanding to original length the collagen diagram of the original tendon is given. A partly chrome-tanned tendon also gave the gelatin diagram after shrinking. This evidence confirms Knapp's theory that the tanned fibrils remain sepd. after contraction while untanned fibrils cling. R. W. RYAN

A method for determining the enzyme value of artificial bates. V. KUBELKA AND J. WAGNER. *Gerber* **52,** 73 *et seq.*(1926).—The Fuld-Gross method for detg. the activity of a trypsin upon casein, slightly modified, is described. H. B. MERRILL

Extraction of shumac for analysis. Comparison of various methods. J. G. PARKER AND L. WINCH. *J. Intern. Soc. Leather Trades Chem.* **10,** 272–80(1926).—Discussion of the effect and relative convenience of varying minor factors in the official method of tannin analysis. J. A. WILSON

Methods for treating and evacuating tannery sewage. JACQUES NOYER. *Halle aux cuirs* **1926,** 272–5; *J. Intern. Soc. Leather Trades Chem.* **10,** 263–6(1926).—See *C. A.* **20,** 3096. H. B. MERRILL

Treatment of packing-house, tannery and corn-products wastes (MOHLMAN) **14.**

Leather. R. H. PICKARD, D. JORDAN LLOYD and A. E. CAUNCE. Brit. 243,438, Aug. 27, 1924. Stuffed leather is made by steeping Cr-tanned leather in the wet-blue condition in a bath of acetone, or spraying it with acetone, until the H_2O content of

the leather is reduced to 14–20%; the acetone is removed and the leather is treated with a stuffing material.

Decorating artificial leather, etc. C. A. HARNDEN. Brit. 243,152, Nov. 11, 1924. Artificial leather, "leather-cloth" or like material is coated with pyroxylin soln. which may be colored, then embossed and marked with a sponge dipped in a pyroxylin soln. of a different color from that first applied, rubbed and again embossed.

Coating fabrics in imitation of leather. H. F. V. MEURLING. Brit. 242,537, May 13, 1925. A fabric such as cotton flannel is coated with a soln. of rubber in C_6H_6 or other solvent to which talc, MgO, Al or Zn has been added, the impregnated product is treated with alc. and is pressed, ground and polished.

Dressing for leather belts. A. KRUEGER. U. S. 1,603,122, Oct. 12. Raw linseed oil 10, chlorinated lime 10–15 parts and smaller quantities of $CaCO_3$ and a volatile terpene oil are used together.

Tanning. R. H. PICKARD, D. JORDAN LLOYD and A. E. CAUNCE. Brit. 243,089, Aug. 27, 1924. A dehydrated skin is treated with a tanning agent in gaseous form, *e. g*, CH_2O, AcH, Br or Cl. Dehydration may be effected by treatment of the skin with acetone. Brit 243,090 specifies treating wet skins with acetone until, if dried at a temp. of about 57°, the pelt will immediately wet back in H_2O or until the pelt is in equil with a mixt. of acetone and H_2O of sp. gr. not greater than 0 81. The acetone is then evapd and the pelt treated with an aq. soln. of tannin. Brit. 243,091 specifies producing a Cr tanned leather that can be wet back by dehydrating the leather from the wet-blue condition by use of acetone

Tanning. J. K. TULLIS. U. S. 1,603,169, Oct. 12. Hides are treated with an aq. soln. of a Cr salt such as $Na_2Cr_2O_7$ 2, $MgSO_4$ 5, and $Al_2(SO_4)_3$ 4 parts.

Combined tanning and dyeing of leather. L. A. JORDAN. Brit. 243,144, Oct. 31, 1924. Dyes such as Quinoline Yellow, Quinoline Yellow K. T., Disulphine Green and Neptune Green, capable of substantially withstanding the bleaching action of SO_2 and sol. bisulfites, are used with tanning materials such as those prepd. from quebracho, mimosa or kahua, in proportion such that the dye "neutralizes" the undesirable color which otherwise would be produced by the tanning agent alone. $NaHSO_3$ or synthetic tannins may be added.

Glue. G. H. OSGOOD. U. S. 1,601,506, Sept. 28. A glue adapted for use on wood, *e. g*, in veneer work, or other materials is formed from peanut meal 100, borax 3, NaOH 2, $KMnO_4$ 1.5, $Ca(OH)_2$ 15, $CuSO_4$ 8, $CaCl_2$ 3 and Na silicate 50 parts, mixed in H_2O. U. S. 1,601,507 specifies cotton seed meal instead of peanut meal in a similar mixt.

30—RUBBER AND ALLIED SUBSTANCES

C. C. DAVIS

The importance of rubber in modern civilization. E. E. SLOSSON. *Ind. Eng Chem.* **18,** 1104–8(1926). E. J. C.

African rubber and its future. A. CHEVALIER. *Rev. gén. caoutchouc* **1926,** no. 21, 29–32; no. 22, 22–4; no. 23, 25–8. C. C. DAVIS

Artificial rubber in Germany during the war. C. C. BURGDORF. *Ind. Eng. Chem* **18,** 1172–3(1926). E. J. C.

Synthetic rubbers. LIPA SLOÏM. *Rev. gén. caoutchouc* **1926,** No. 20, 13–4; No. 21, 8–11; No. 23, 3–6; No. 24, 3–7; cf. *C. A.* **20,** 1728.—Historical, including the polymerization of hydrocarbons to rubbers, syntheses of isoprene and butadiene and their properties. C. C DAVIS

Has the synthesis of rubber already been accomplished? J. R. KATZ. *Kolloidchem. Beihefte* **23,** 344–8(1926).—It is considered that the failure of any type of synthetic rubber to give a crystal x-ray spectrum when elongated (cf. *C. A.* **19,** 2144) is sufficient evidence that it differs fundamentally from natural rubber. Further expts. with various types of synthetic and natural rubbers confirm these facts, and since a true synthetic rubber must consist of a polyprene which has on stretching a fiber structure and an x-ray diagram like natural rubber, it can only be concluded that natural rubber has not yet been duplicated synthetically. C. C. DAVIS

Further advances in the theory of the needle-shaped rubber molecule. E. LINDMAYER. *Gummi-Ztg.* **40,** 2805–7(1926).—The hypothesis has already been advanced (*C. A.* **20,** 3096) that the rubber mol. is needle-shaped, and the properties of raw rubber under various conditions were explained in terms of this theory. In the present paper, unsupported as before by direct exptl. evidence, the needle theory is utilized to ex-

plain other phenomena encountered in raw rubber and the properties of vulcanized rubber. Among the subjects discussed are the mol. structure of raw rubber before and after disaggregation through mastication, the crit. (transition) point of raw rubber, the Joule effect, the mechanism of acceleration, the bending of hard rubber, the aging (oxidation) of soft rubber and the regeneration of rubber. Besides the determinant influence of the needle structure on the phys. properties, the latter are influenced by changes from larger to smaller mols. and *vice versa*, thus: $(C_5H_8)_{12} \rightleftharpoons (C_5H_8)_6 \rightleftharpoons (C_5H_8)_3$. Vulcanization in the ordinary manner is assumed to yield the *compd.* $(C_5H_8)_6$.-$S(C_5H_8)_6$, the chem. satn. of which is the same as the original C_5H_8 nuclei in the raw rubber, since treatment with Axelrod-Bude reagent shows an unchanged Br absorption.
C. C. DAVIS

X-ray contributions to the analysis of the structure of rubber and allied materials. GEO L. CLARK. *Ind Eng. Chem.* **18,** 1131–6(1926) —A crit. review and discussion of the applications of x-rays to the study of the structure of rubber and of similar substances. Accompanying this survey of present developments are references to completed and to uncompleted work of the author on the *structure of C black, rubber, balata, gutta-percha, gelatin, collagen, glue, shellac,* other *proteins* and *resins* and *linseed oil* under different conditions. It has been found that C blacks vary in structure from practically amorphous to definite graphitic crystals. Repeated expts. failed to give evidence of the existence of the rubber crystals reported by Pummerer and Koch (*C. A.* **18,** 3737). On the other hand the x-ray measurements of Ott (*Naturwissenschaften* **14,** 320(1926)) were almost exactly duplicated, and from these it was calcd. that the *max formula of rubber* is $(C_5H_8)_6$. Based on the theoretical deductions of Polanyi and on the x-ray diagram of stretched rubber, calcns. show the "*unit rubber crystal*" to be $(C_5H_8)_4$, or if the factor 2 applies to 1 dimension, to be $(C_5H_8)_8$, a simple structure compared with the high polymerization ordinarily assumed. Unlike rubber, balata is cryst. under all conditions, though amorphous material is also present, and x-ray analysis indicates that its unit cell contains 4 mols. The structure is, however, distinctly different from that of rubber. Calcns. in connection with balata emphasize the uncertainty of d. measurements, since the system is 2-phase and since the packing in org crystals is not close. Like balata, gutta-percha has a cryst. structure before stretching, but its structure differs from that of balata and of rubber. Calcns. based on provisional data show the max. no. of mols in the unit cell to be 12, whereas based on its d. this value becomes 8. Gelatin, collagen, glue and other proteins show an amorphous structure before stretching and evidence of a crystal-like phase when stretched. The order of magnitude of the unit cells is probably the same as for rubber. Shellac shows evidence of both cryst. and amorphous phases, but on heating in an inert atm. the cryst. phase disappears.
C. C. DAVIS

The structure of elongated rubber samples. II. E. A. HAUSER AND H. MARK. *Kolloidchem. Beihefte* **23,** 64–78(1926).—A review of all the theories of rubber structure in the light of recent x-ray investigations. As a result of this survey H. and M. continue to regard their own theory, already published elsewhere (*C. A.* **20,** 3360), as the most valid one.
G. L. CLARK

Artificial aging tests on plantation rubber. ANON. *Bull. Imp. Inst.* **24,** 209–19 (1926).—See *C. A.* **20,** 2428.
A. PAPINEAU-COUTURE

Investigations on the role of the albumin of Hevea latex. J. GROENEWEGE. *Mededeel Alg. Proefsta. Landb.* [*Nederland.-Indië*] **20,** 1–25(1924); *Botan. Abstracts* **15,** 630.—A discussion of the significance of albumin in connection with coagulation ripening, and permeability and drying. The role of enzymes in coagulation is also discussed.
H. G.

Rubber as a dispersion medium. H. POHLE. *Kolloid-Z.* **38,** 75–6(1926).—The irregularity with which, in practice, fillers are dispersed in rubber is discussed. A prominent contributory cause is the tendency for very fine powders to "pack" to form secondary particles which are often exceedingly resistant to disintegration. Measurement of the light absorption of thin films of rubber-filler mixts. gives useful information about the degree of dispersion of the latter, and the progress of the mixing process.
B. C. A.

***p*-Nitrophenol as a preventive of mold on sheet rubber.** T. E. H. O'BRIEN. *Trop. Agr.* (Ceylon) **65,** 333–5(1925).—Soaking rubber in 0.1% solns. and subsequent drying were entirely satisfactory in preventing mold. There was no chem. reaction or change in appearance of the rubber.
A. L. MEHRING

Aggregation and reaggregation of crude rubber in the presence of other materials. M. KRÖGER. *Gummi-Ztg.* **44,** 2429–30(1926); cf. *C. A.* **20,** 2430.—The effect of nonrubber substances on the state of aggregation and on the reaggregation of rubber was

studied by following the progressive changes in phys. properties on long standing. By detg. the effect of the natural resins on the one hand and of powders such as C black and MgO added artificially on the other, the influence of widely different types of non-rubber substances was ascertained. A high natural-resin content (over 4%) retards the reaggregation of rubber as judged by tests of samples stored for 5 yrs. C black in small proportions has a retarding effect which is more pronounced the poorer the grade of black. In small quantities the better grades retard reaggregation and in large amts. accelerate it, a phenomenon analogous to the coagulation of kieselguhr or of W hydroxides by concd. HCl (cf Kröger, *C. A.* **16**, 1525). MgO retards reaggregation and the finer the particles, the greater this retardation. Piperidine accelerates reaggregation, a phenomenon which may be in some way related to its accelerating action in vulcanization. PER K. FRÖLICH

Importance of particle character in a rubber "pigment." D. F. TWISS. *Trans. Inst. Rubber Ind.* **2,** 78–84(1926).—A review and discussion, with 20 references to closely related work. C. C. DAVIS

The influence of particle size in rubber manufacture. S. S. PICKLES. *Trans. Inst. Rubber Ind.* **2,** 85–8(1926).—A general discussion. The only new work is a report of an *x-ray examn. of acetylene black, American gas black and oil black,* all of which showed the same character and probably consisted of mixts. of cryst. and amorphous C, with the cryst. structure in the highest proportion in the acetylene black. C. C. DAVIS

Particle shape. PHILIP SCHIDROWITZ. *Trans. Inst. Rubber Ind.* **2,** 89–91 (1926) —A brief discussion of the principles underlying the influence of particle shape on the phys. properties of rubber. The phenomenon of tearing is due to an alignment of anisotropic particles (cf. Vogt and Evans, *C. A.* **17,** 3807). For this reason any process of manuf which, unlike calendering, distributes the particles in a heterogeneous manner in the mastic results in a vulcanized rubber with diminished tendency to tear. Thus a rubber mixt. prepd. by spraying a suspension of colloidal clay in vulcanized latex and heating under pressure yielded a product which could be regarded from a practical point of view as non-tearing. C. C. DAVIS

Particle size effects in rubbers subjected to repeated stress. T. R. DAWSON. *Trans. Inst. Rubber Ind.* **2,** 92–5(1926).—Though much work has been done on the influence on the phys. properties of vulcanized rubber of reënforcing fillers, their influence on rubber subjected to repeated stresses has not been studied quantitatively. To obtain information on this point the phys. properties of rubber-S mixts. contg. equal vols. of fillers (20 vols. per 100 vols. of rubber + S) were detd. before and after repeated stressing. All fillers tested, *viz.*, barytes, ZnO (colloidal and ordinary), clay, light Mg carbonate, lamp black, gas black and gas black + pine tar, increased the energy loss (hysteresis after a definite no. of cycles at 150% elongation), in general the finer the particles the greater this loss. The losses were, however, relatively small with ZnO, probably because of its heat cond. No significant increase in vol. occurred after 1300 cycles at 150% elongation. C. C. DAVIS

The influence and elimination of coarse particles. NÖEL HEATON. *Trans. Inst Rubber Ind.* **2,** 96–9(1926) —A discussion of the particle size of paint and rubber pigments and tests available for measuring this property. Experience has shown that in classifying pigments it is convenient to group their particles in 3 sizes: *coarse,* diam. over 60 microns, *intermediate,* diam. 10–60 microns and *fine,* diam. under 10 microns. In the manuf of paint, the intermediate particles have a disturbing influence on the product, interfering with the flow, causing speckiness and rendering the dispersion unstable. In rubber their detrimental influence is still greater. C. C. DAVIS

The value of a direct measurement method for particle-size determination. HENRY GREEN. *Trans. Inst. Rubber Ind.* **2,** 107–15(1926).—A direct or photomicrographic method for detg. the particle size of a pigment has the advantages over other methods that it gives a distribution curve (particle size *vs* frequency) and does not always require the assumption of a cubical or spherical particle. From the distribution curve all necessary data can be obtained for calcg. the av. diam. It is particularly to be emphasized that sp. surface cannot be detd. by ultramicroscopic measurements. Various aspects of the problem are discussed, in part mathematically, including the prepn of samples, the relation of particle shape to av. diam. and diffraction effects. Eleven references to closely related work are appended. C. C. DAVIS

An apparatus for the separation of grit and coarse particles from fine powders. G. GALLIE AND B. D. PORRITT. *Trans. Inst Rubber Ind.* **2,** 116–9(1926).—An app is described and illustrated which was designed to overcome the errors inherent in the simple sieve test and to remove completely the personal factor. In principle it consists

of suspending the powder in water and furnishing a gentle stream of water to wet the powder and maintain the vol. of liquid in the funnel-shaped app. const., and a high-pressure jet of water to break up aggregates and keep the liquid in motion. C. C. D.

Detection of grit and rubber pigments. E. A. MURPHY. *Trans. Inst. Rubber Ind.* **2**, 100–6(1926).—Though elutriation is not so simple a method as a sieve test for detg. the grit in pigments, nevertheless for some pigments it gives more reliable results. An app. is described and illustrated, which has an elutriating tube used by Lowry (cf. *C. A.* **16**, 3016) but modified in form. Only coarse powders such as barytes can be elutriated with water and finer ones must first be dispersed in a medium such as a soln. contg. 0.5% NaOH and 0.1% glue, which is then used for elutriation. Because of the tendency to form agglomerates, substances such as lithopone give a residue which is not true grit, but which on the other hand may also fail to disperse in rubber. Therefore the elutriation test even in this case may give a better indication than the sieve test of the behavior of a pigment in rubber. The difficulty in dispersing lithopone may account for its poor reënforcing properties compared with ZnO. C black cannot be elutriated. For general routine analysis the new method of Gallie and Porritt (cf. preceding abstr.) is to be preferred and is highly recommended. C. C. DAVIS

Is there a substitute for American carbon black? WM. B. WIEGAND. *India Rubber J.* **72**, 385–8(1926).—Comparative tests of 2 grades of lampblack and a gas black in typical rubber mixts. designed to withstand abrasion show the superiority of the vulcanized mixts. contg. gas black. This superiority was manifest in the tensile strengths, elongations at rupture, resilient energies and resistances to abrasion. C. C. DAVIS

Some observations on rubber-proofed garments and adhesive rubber solutions. WERNER ESCH. *Gummi-Ztg.* **40**, 2697(1926); *India Rubber J.* **72**, 499–501(1926).—Wide experience in the manuf. of rubberized cloth has led to certain observations from which certain conclusions may be drawn. Fabrics should be free from Cu, Mn and salts having an acid reaction, *e. g.*, Fe salts, and should contain not over 1.5% grease or oil Rubber solns. should contain only dry rubber, with a low resin content, previously milled for about 0.5 hr. at 70–80°, and dissolved in dry benzene or benzine. The best solns. contain only benzine or benzene (or a mixt.) distg. completely below 100°; for less important uses benzine distg. up to 120° may be used. Water in such solns is an adulterant and is particularly objectionable when rosin is also present. The addn. of rosin increases the apparent tackiness but reduces seriously the adhesive power, and is highly objectionable. Proofing compds. for raincoats should be wholly free of Mn, Cu, sol. Fe salts and Pb compds. sol. in HOAc, should contain not over 5% brown factice, and should contain enough MgO to neutralize any free acid formed. Factice for such use should not be made of mixed oils and preferably should be prepd. from pure rape oil. Rape-oil factice improves the aging properties and reduces the quantity of benzine required. C. C. DAVIS

Some points in connection with the manufacture of rubber. T. E. H. O'BRIEN. *Trop Agr.* (Ceylon) **66**, 283–6(1926).—Coagulants and means for preventing mold are discussed. A. L. MEHRING

Fertilizing rubber gardens in Java. A. J. ULTEE. *Trop. Agr.* (Ceylon) **67**, 31–6 (1926).—Fertilization of *Hevea* trees had no noticeable effect on the production or quality of latex or on the resistance to disease shown by the trees. A. L. MEHRING

Reclaiming rubber from tire stock. ANON. *Chem. Met. Eng.* **33**, 527–8(1926).—An illustrated description of modern industrial developments. C. C. DAVIS

The electrical precipitation of rubber on metals and wood. FRANZ MEYER. *Korrosion* **1**, 21–2(1926); cf. Elliot, *C. A.* **20**, 2622. J. H. MOORE

The acceleration of vulcanization in theory and practice. FRIEDR. EMDEN. *Kautschuk* **1926**, 137–8, 180; cf. *C. A.* **20**, 2919.—Various patented accelerators are described, with 44 references, chiefly to patents. C. C. DAVIS

Vulcanization and accelerators. ANDRÉ DUBOSC. *Rubber Age* (N. Y.) **15**, 92–4, 133–5, 219–21, 259–61, 305–6, 344–5, 385–6, 426–7, 459–61(1924); **16**, 51, 53, 119–20, 154–6, 192–3(1924); **16**, 264–5, 335–6, 370–1, 408–9(1925); **17**, 23–4, 60–1, 96–7, 132–3, 168–9, 240–1, 272–3, 308–10, 341–2, 376–7(1925); **18**, 24–5, 129–30, 165–6(1925); **19**, 104–5, 144–5, 353–4(1926).—A monograph in the form of a series of articles comprising a crit. review and discussion of the various theories of vulcanization proposed in the past, of the role of different non-rubber substances naturally present or added artificially to rubber, and other closely related subjects pertaining directly or indirectly to the mechanism of vulcanization. The published work of numerous investigators is reviewed in great detail and in some cases expts. hitherto unpublished are described as a means of supporting the point of view in question. C. C. DAVIS

The use of furfural in rubber manufacture. C. S. Miner. *Rubber Age* (N. Y.) **19,** 565–6(1926).—A description of the chem and industrial history of furfural, its production and properties, and derivs. of interest to the rubber industry. C. C. D.

Furfural derivatives as rubber accelerators. J. P. Trickey and G. J. Leuck. *Ind. Eng. Chem.* **18,** 812–3(1926); *India Rubber J.* **72,** 383–4(1926); *India Rubber World* **74,** 328–9(1926).—From furfural may be prepd. derivs. which have a marked accelerating action, varying from the ultra type to those having only a weak activity. In general, derivs. prepd. from aromatic compds. have a relatively low accelerating activity and those from aliphatic compds. a relatively great activity. Expts. were carried out and data are given to show the accelerating activity of hydrofuramide, furfurine, the condensation products of furfural with $PhNH_2$, Ph_3N and $PhNMe_2$, two types of the compd. $(C_4H_3O\ CHS)_3$, ethylfurylamine, furylideneethylamine, dithiofuroic acid, Zn dithiofuroate and Pb dithiofuroate. Some of the tests are compared with tests of hexamethylenetetramine and diphenylguanidine. Hydrofuramide and furfurin, so far the best known of the derivs , were found to be approx. $^1/_3$–$^1/_2$ as active as hexamethylenetetramine or diphenylguanidine. Also in abridged form in *Chem. Trade J.* **74,** 221–2(1926). C. C. Davis

Sulfur determination in vulcanized rubber. P. Dekker. *Chem. Weekblad* **23,** 369–75(1926) —The methods used in different countries for detn. of free and bound S have been compared. For free S the Dyer and Watson method (*C. A.* **16,** 3557), the Am. Chem Soc. method (*C. A* **18,** 1763), the German method (*Chem.-Ztg* **47,** 19(1923)) give equally good results. Byam's method (*India Rubber J.* **66,** 678(1922)) is rather cumbersome For routine work the American method is preferred, if the S content is very high the old Dutch method is used (acetone ext. boiled with HNO_3(d 1.4), S detd in soln as $BaSO_4$, undissolved residue directly weighed as free S). For total and for combined S the methods of (*a*) Stevens (*C. A.* **13,** 1030), (*b*) Pearson (*C. A* **15,** 960), (*c*) Dyer and Watson, (*d*) Munro (*C. A.* **14,** 1908), (*e*) Kratz, Flower and Coolidge (*India Rubber World* **61,** 556(1920)), (*f*) Waters and Tuttle (cf. Collier, *C. A.* **17,** 3807) were examd Method *a* is impractical; *b* and *c* give low results; *d* is not dependable, *e* and *f* are most useful Method *e* is recommended for elastic rubber (up to 10% combined S), method *f* for ebonite and rubber-S mixts with high free S. A slight improvement on the results of *e* could be obtained by addition of Br to the $Zn(NO_3)_2$ digestion. In the Parr S bomb combustion method difficulties were experienced, mainly due to corrosion of the bomb material. The ter Meulen-Heslinga (*C. A.* **16,** 2094) reduction method is accurate, but impractical on account of the small sample (10 mg.) used. B. J. C. van der Hoeven

Future commercial prospects for synthetic rubber. Wm. C. Geer. *Ind. Eng. Chem.* **18,** 1136–7(1926) —Chemically the prospects are good, but from an economic standpoint there is little chance of synthetic rubber becoming of com. importance. Moreover the raw materials from which it might be produced have other vital uses and are irreplaceable C. C. Davis

The direct use of rubber latex, especially vulcanized latex. Philip Schidrowitz. *Ind. Eng. Chem.* **18,** 1147–52(1926) —A detailed historical survey of published work on the direct use of latex, either raw or vulcanized, in the manuf. of rubber goods, including its use in tires, mech goods, ebonite, proofing, thread, dipped goods, paper, fibers, artificial silk, paints, adhesives, casein products, molded goods, etc. (cf *C. A* **20,** 2595). The concn. of latex, the vulcanization of latex and the general properties of vulcanized latex are also described, with a comparison of raw and vulcanized latex rubber. The manuf. of goods from and with vulcanized latex is in com. operation in England and the process is no longer in the lab. stage. Numerous references, chiefly to patents, are included. C. C. Davis

Cinematomicrographs of Brownian movement in rubber latex and of the dissection of single latex particles with the micromanipulator. E. A. Hauser. *Ind. Eng. Chem.* **18,** 1146–7(1926).—A descriptive text (by Geo. L. Clark), with representative reproductions, of a cinematomicrograph by H. portraying (1) the Brownian movement in unvulcanized and vulcanized latex, and (2) the puncturing and dissection of individual globules by means of a specially designed micromanipulator. C. C. Davis

Antioxidants and their retarding action in the deterioration of rubber. L. E. Weber. *Ind. Eng. Chem.* **18,** 963–4(1926); *India Rubber J.* **72,** 503–4(1926).—A review and discussion of the oxidation theory of deterioration and its inconsistencies, the antioxidizing action of accelerators, the function of antioxidants and their com. use. C. C. Davis

The preparation of smoked sheets. Estate factory practice in Sumatra. H. N. Blommendaal. *India Rubber J.* **72,** 429–34, 464–6(1926).—An illustrated description of current practice, dealing in detail with the receiving of the latex, straining, mixing

tanks, anti-coagulants, the coagulation process, smoking and finishing of the sheet rubber and the latest types of equipment. C. C. Davis

Heat-resistant vulcanized rubber mixtures. Werner Esch. *Gummi-Ztg.* **40,** 2862–3(1926).—Formulas recommended for inner tubes, air-bags, steam hose, hot-water bags and conveyor-belt covers are itemized. C. C. Davis

Recent developments in the preparation of plantation rubber. H. P. Stevens. *Ind. Eng. Chem.* **18,** 1116–21(1926).—A comprehensive crit. review and discussion. No radical changes in the methods of prepg. plantation rubber are foreseen, for as a whole present methods are correct in principle and yield a satisfactory product. The most to be expected is an improvement in the details of prepn. and the production of sheet and crepe rubber of greater uniformity and freedom from mold, spots and minor defects. Alum is not so bad a coagulant as has been suggested, for it has no particular disadvantage except for its tendency to retard the rate of cure, and this may be counterbalanced by allowing the rubber to mature. H_2SO_4 also retards the rate of cure, but in small amts., *e. g.*, 1 part per 2000 of latex, this effect is slight. Quant. data are given to show the influence of alum, H_2SO_4 and HOAc on the rate of cure. No other deleterious action can be ascribed to H_2SO_4, and sheet rubber coagulated with H_2SO_4 is in good condition 20 yrs. later. H_2SO_4 thus differs from HCl or H_3PO_4, both of which cause tackiness. Na_2SiF_6, though a fungicide, has failed to prevent the growth of mold, but it has proved of great value in preventing gaseous fermentation in latex arising from bark molds or bacteria, thus allowing the prepn. of bubble-free sheet rubber from infected latex. Only $^1/_3\%$ on the rubber content of the latex is necessary. Because of its new cheap production and its greater coagulating power, it is predicted that HCO_2H may gradually replace HOAc as the most widely used coagulant. Light dry molds do not influence the rate of cure or other properties of sheet rubber. If however, the sheets are moist with a close damp mold, the rate of cure is usually slower, particularly with PbO, because the molds consume the natural fatty acids of the rubber. The addn of stearic acid to mixts contg. moldy rubber is therefore advisable. A similar slowly curing though superficially clean rubber may be the result of invisible internal mold. Vulcanization tests of the moldy portions of crepe with spotty mold show that they have a slower rate of cure than the clean portions. Of all the fungicides tested, the most effective and promising are *p*-nitrophenol and 3,5-dinitro-*o*-cresol, and confirmatory tests of sheet and crepe contg. *p*-nitrophenol (0.1% of the rubber) by American manufacturers show favorable results. These 2 compds. enable the marketing of clean unsmoked sheet. Properly prepd. air-dried crepe is as good in quality as sheets and it is more uniform. The drying of crepe, the characteristics of "whole latex" rubbers, the production of very pale crepe by fractional coagulation, the methods of prepn. and the characteristics of sheet rubber, the rolling process, scrubbing and smoking and packing are also discussed, besides other subjects which are published elsewhere C. C. Davis

Developments in the Netherlands Indies rubber-planting industries. Otto de Vries. *Ind. Eng. Chem.* **18,** 1129–31(1926).—A crit. review of present developments, most of which have been described elsewhere. For most uses plantation rubber is now so good that the manufacturer should direct his attention to a systematic study of mastication and the control of plasticity. Indications point to the production for the most part of a cheap, uniform, inherently good rubber, and a relatively small quantity of special types, such as very pale crepe, certificate rubber with a particularly uniform rate of cure, rubber contg. a min. amt. of serum substances, etc. C. C. Davis

Botanical and chemical developments in the plantation industry. J. W. Bicknell. *Ind. Eng. Chem.* **18,** 1109–13(1926).—A survey of present developments, including the difficulties of field experimentation, the control of tree diseases, the yields of latex under different conditions, budding, tapping and results obtained with artificial fertilizers. C. C. Davis

Possibilities of wild and plantation rubber production in tropical America and Africa. H. N. Whitford. *Ind. Eng. Chem.* **18,** 113–6(1926).—Economics. C. C. Davis

The botany and cultural problems of guayule. Wm. B. McCallum. *Ind. Eng. Chem.* **18,** 1121–4(1926).—The subjects include the botany and general characteristics of the shrub, its rubber and resin content, cultivation problems, the germination of seeds, production of seedlings on a large scale and the maintenance of a high rubber content. C. C. Davis

The production of guayule rubber. Geo. H. Carnahan. *Ind. Eng. Chem.* **18,** 1124–6(1926).—Economics. C. C. Davis

The chemistry of guayule. David Spence. *Ind. Eng. Chem.* **18,** 1126–8(1926).—The difficulties encountered in the past in prepg. and utilizing guayule rubber have been overcome and a rubber can now be prepd. by simple means which compares

favorably in its vulcanizing properties and in its quality in the cured state with high-grade plantation rubber. The mech. process of prepn., which is described in detail is economically superior to the solvent extn. process and it is now the usual com. mode of prepn. A good av. shrub yields 14–16% rubber (dry basis), the rubber contg. in turn about 22% Me_2CO-sol. substances and traces of ethereal oils, N and insol. residue. The yields of rubber and its Me_2CO-sol. components however vary with the variety of shrub, its age, the nature of the soil, etc. Selected varieties (Cal.) have yielded up to 22% pure rubber. The Me_2CO-sol. components can be reduced to less than 0.5 their normal amt. by boiling 2% aq. NaOH. Complete elimination is however probably undesirable on account of the adverse influence on the properties of the rubber for most uses. The rapid deterioration in quality and diminished yield of rubber on storage when not removed from the shrub have generally been ascribed to oxidation. This could not be substantiated. The Me_2CO-ext. is actually lower in the deteriorated rubber, and phys. changes in the colloidal state, involving depolymerization, are more probable. The tendency to deteriorate can be retarded and improvements in the quality of the rubber can be realized by proper treatment of the harvested shrub.
C. C. Davis

Preparation of synthetic rubber hydrocarbon (Calvert) **10.** Thermostatic control device for vulcanizing apparatus (U. S. pat, 1,601,408) **1.** Waterproofing cement mixtures, etc., with rubber latex (Brit pat. 242,345) **20.** Thiazoles (U. S. pat. 1,591,440) **10.**

Rubber compositions. C. O. North. U. S. 1,602,624, Oct. 12. $(NH_4)_2CO_3$ or other suitable heat-decomposable material is suspended in a liquid boiling above 100°, *e. g.*, a petroleum oil, and this suspension is added to plasticized rubber on the mixing mills, to produce semi-hard sponge rubber.

Rubber compositions. A. B. Cowdery. Brit. 243,384, Nov. 22, 1924. An ingredient of rubber compns. consists of the residue obtained by distg. coal tar until a large proportion of the volatile constituents is removed and the residue contains about 60% free C and has a m. p. of about 175–250° and a sp. gr. of 1.30–1.35. Natural gas may be used to facilitate the distn. of the tar and the residue is finely ground and milled into the rubber. The material has less coloring effect than C black and up to 15% of it may be added to tan-colored shoe heels or soles.

Rubber compounds. R. Russell and H. Broomfield. U. S. 1,601,772, Oct. 5. See Brit. 231,988 (*C. A.* **19,** 3617).

Coloring rubber. H. Lindemann. Brit. 243,605, Apr. 21, 1925. Sponge rubber having fine pores is sprayed with colored latex or colored solns. or emulsions of rubber A method of forming rubber with small pores is described.

Coloring rubber. Gummiwaren-Fabrik M. Steinberg. Brit. 242,900, April 17, 1925. In forming dipped rubber articles, a bath with a color-patterned upper layer is used, to produce a surface of mottled or marbled design.

Joining hard and soft rubber. W. A. M. Valon and Paragon Rubber Manufacturing Co., Ltd. Brit. 242,687, July 12, 1924. In forming battery boxes or other articles of united hard and soft rubber, an accelerator is incorporated in the compn. forming the hard rubber and vulcanization of the hard and soft rubbers is effected together in a single operation.

Composition for shoe heel treads, etc. B. W. Rote. U. S. 1,601,327, Sept. 28. Cotton fiber 70, Para rubber 15, PbO 5, MgO 5, gloss black 3 and S 2 parts are formed into vulcanized sheets.

Concentrating latex on a rotary drum or similar apparatus. K. D. P., Ltd. Brit. 243,016, Nov. 14, 1924.

Vulcanizing rubber. L. B. Sebrell. U. S. 1,591,439, July 6. Compds. such as 2-mercapto-4-phenylthiazole or its Zn, Pb, Cd, Hg or other metallic salts or corresponding thiazyl disulfides and polysulfides are used as accelerators. U. S. 1,591,441 specifies the use of similar compds. in which a H atom may be present instead of the Ph group. 2-Mercapto-4-methylthiazole also is referred to for use with S and ZnO. Cf. *C. A.* **20,** 3590.

Vulcanizing rubber. S. J. Peachey and A. Skipsey. Brit. 242,464, Dec. 9, 1924. Can. 264,042, Sept. 7, 1926. Rubber vulcanized by means of sulfides of P is subjected to an after-treatment with NH_3, either in gaseous form or in soln.

Devulcanizing rubber. C. F. Willard. U. S. 1,602,062, Oct. 5. Vulcanized rubber is devulcanized by boiling in a emulsoid colloid soln. such as tar, rosin, pitch, gum or balsam soln. and a S solvent, *e. g.*, turpentine, and after devulcanization the boiling is continued to dissolve the rubber. Cf. *C. A.* **20,** 3590.

CHEMICAL ABSTRACTS

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I. AUTHOR INDEX

("P" before a page number indicates "Patent")

NOTE —In the transliteration of names originally written in Russian, the system followed so far as possible is that of *Nature* (Feb 27, 1890), in which *v* is used instead of the *w* or *ff* of other spellings, *sh* instead of *sch*, *ch* instead of *tsch*, *i* instead of *j* or *v*, etc. Thus Pavlov, not Pawlow; Chugaev not Tschugaeff To make quite sure, users of the index should in such a case look under both spellings

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Eitel, W. Wissenschaftliche Forschungsberichte— Naturwissenschaftliche Reihe Pt. XIII. Physikalisch chemische Mineralogie und Petrologie -Die Fortschritte in den letzten zehn Yahren (book), 539, Ueber die Synthese der Feldspatvertreter (book), 802; alleged sillimanite in ceramic products, 1699, synthesis and modes of occurrence of scapolites, 2805, equilibria in systems of silicic acid, Al, lime and soda, 2960

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Elliott, C. Distn. in Practice (book), 955, electrolytic caustic soda, 1956.

Elliott, F. A. Electrodeposition of rubber suggests many industrial applications, 2622

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Ellis, C., and Meigs, J. V. Gasoline and Other Motor Fuels (book), 1713.

Ellis, C., Wells, A. A., and Boehmer, N. The Chem. Action of Ultra-violet Rays (book) 338.

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Faurholt, C. Studier over Kuldioxyd og Kulsyre og over Karbaminater og Karbonater (book), 1965.
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Fink, C. G., and Philippi, C. A. Voltage studies in Cu-refining cells, 3394
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Fink, E. A. B. C. der Pflanzenernährungs- und Düngerlehre (book), 1884.
Fink, G. J. Practical aspects of research, 2600.
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Fisher, H. L., Gray, H., and McColm, E. M. Rubber di[hydroxyphenyl] and its dimethyl ether, 1987.
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Fues, Ernst, and Giesecke & Devrient. Special papers, P 1905.

Fueter, R Das mathematische Werkzeug des Chemikers, Biologen und Statistikers (book), 1941

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Gardner, W. Chemical Synonyms and Trade Names (book), 1911.

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Gastaldi, C., and Stratta, R. α-Ketoformohydroxamic acids and derivs. (XI), 1978.

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Gautschi, A. Die Aluminiumindustrie (book), 1975
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Hertwig-Möhrenbach. Der Emaillermeister—Das Emaillieren (book), 1891
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Kolthoff, I. M., and Tekelenburg, F. Potentiometric detn. of the H-ion concn. at high temps., 1750.

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Meyer, Richard. Chemie in Natur und Kultur (book), 1171.
Meyer, Robert. Lipoids and ovarian function, 1262; coating leather with rubber, P 3587.
Meyer, R. J. Gmelins Handbuch der anorg. Chemie (book), 2963.
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Meyer, Wilhelm. Chemie für Mittelschulen

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Michaelis, L., and Dokan, S. Elec. phenomena and ionic permeability of membranes (VI) paraffin, wax, mastic and rubber membrane, 1940
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Washburn, E. W. Principes de chimie physique du point de vue de l'atomistique et de la thermodynamique modernes (book), 1555, Introduction aux principes de la chimie physique (book), 1754; estg. at. wts. with the aid of the periodic law, 3365.

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SUBJECT INDEX

KEY

In using this index the following should be borne in mind:

1. **Subjects**, not words, have been indexed.
2. **Abstracts,** not merely their titles, have been considered in indexing.
3. The small **superior numeral** which accompanies each page number designates the fraction of the page in ninths in which the subject being indexed is first considered. The printed matter only, exclusive of page **headings,** has been thus subdivided.
4. "P" before a page number indicates that the abstract is of a **patent.**
5. The **alphabeting of index headings** has been done on the basis first of that part which comes before the comma in such headings as *Copper, metallurgy of* and *Phenol, p-nitro-*. *E. g.*, these headings come before the headings *Copper compounds* and *Phenol condensation products,* respectively.
6. **Organic compounds** are indexed on the basis of "parent compounds," or more accurately, "index compounds" (see Introduction), the names of substituent radicals following in alphabetical order. The system of naming organic compounds which has been used is outlined in the Introduction below. Esters and salts of organic acids are, in general, indexed under the names of the acids; notes in the index under the appropriate headings explain the few exceptions.
7. An **asterisk** (*) following the name of an organic compound entered in the index signifies that the name, or numbering, or both, are the author's own and may not conform to the system of nomenclature used in this index. This sign is used where it has seemed inadvisable, owing to incomplete information, to attempt to make the name conform to the system, or where the author's name, differing widely from the one given to the compound by the indexer, is given as an extra entry.
8. A **dagger** (†), which follows the names of a few compounds, signifies that the entry is an extra one, the name being only slightly less favored than the one chosen for the other entry. The preferred name can be determined by reference to the Formula Index.

The desirability of making the index readily usable without the need of reference to an elaborate introduction has been held constantly in mind. Although an introduction seems desirable and should be helpful, nevertheless the index is dependent neither on the Key nor on the Introduction. Numerous cross-references are given throughout the index, and notes appear in connection with certain headings. An examination of the Introduction, which follows, should be especially helpful to those interested in looking up organic compounds.

INTRODUCTION

General policy The indexing of subjects, as opposed to word-indexing, has been emphasized. This avoids omissions, scattering and unnecessary entries; with the abundant cross-references used it means that one should be able to find all of the references on any subject with certainty and with a minimum of effort. The words used as subject headings or in modifying phrases are not necessarily to be found in the abstracts but an expression of the idea suggested will be found within or beginning in the ninth of the page designated by the small superior numeral following the page number. Chemical compounds have been named and entered systematically; the system used is outlined below. All new compounds and all elements, compounds and other substances for which new data are given have been indexed, with the single exception of new compounds for which no name or structure has been given. Such compounds are entered only in the Formula Index. The Subject Index is in no other respect altered because of the Formula Index.

Modifying phrases In writing such phrases for the entries under any heading the words have been arranged so that the idea considered to be the most important is expressed at the beginning whenever feasible and this procedure, as well as the selection of the words for this purpose, has been governed by numerous formulated general principles and specific rules. *E. g*, "detection of" has been used consistently whenever correct at the beginning of the modifications in indexing subjects treated from a qualitative analytical point of view, instead of permitting a scattering under such additional phrases as "test for," "reaction for," etc., regardless of what words may have been used in the text. In the case of appropriate headings the selection of first words for modifications has been made on the basis of a definite system of classification. Under a few large headings two or more entires have been made on indexing a subject in a single abstract in case two or more ideas could be used equally well to start the modifying phrase. In alphabeting modifying phrases prepositions at the beginning have been ignored.

References to fractions of the page. One can readily estimate ninths of a page with considerable accuracy by placing the fore or middle finger one-third of the distance from the top of the printed matter on the page and the thumb one-third of the distance from the bottom, a procedure very easily carried out.

Inorganic compounds. Simple inorganic compounds are entered under the usual names. In indexing compounds of iron, gold, copper and tin such headings as *Iron sulfates*, under which both the "ous" and "ic" salts are entered, have been used rather than headings beginning with "ferric(ous)," "auric(ous)," "cupric(ous)," or "stannic(ous)." Acid salts, such as NaH_2PO_4, are entered under such headings as "*Sodium phosphates*." With the exception of a few very common compounds, such as carbon dioxide and carbon monoxide, compounds of a given element with another or with a definite radical, which differ only in valence relations, are grouped. *E. g.*, the various oxides of nitrogen are grouped under the heading "*Nitrogen oxides*" and classified there. Complex inorganic compounds which cannot be given definite names satisfactory for indexing are usually indexed under the heading which represents the class of compounds concerned and under a heading of the type *Nickel compounds*, depending on what the significant element is. *E. g.*, dichlorotetraamminecobaltic chloride would be indexed under "*Ammino compounds*" and under "*Cobalt compounds*." The Formula Index, which follows the Subject Index, should be particularly helpful in locating complex compounds.

Organic compounds. The system used for naming and indexing organic compounds is the same as that in use starting with the 1916 volume. An explanation of it by

Austin M. Patterson and Carleton E. Curran, who are its originators, has appeared in another journal of the Society.[1] The system is based on existing usage and follows this as far as is practicable, so that a great many familiar names are unaffected. Only the general principles will be given here, but in the index itself will be found abundant cross-references and also notes under *Alcohols*, *Ketones*, etc., indicating how compounds of these classes are named.

1. The chief function of a compound is expressed *in the main part of the name* wherever possible, and not as a substituent, thus: Pyrrolecarboxylic acid, not carboxypyrrole; ethyl alcohol or ethanol, not hydroxyethane; pentanone, not ketopentane.

2. In compounds of mixed function, the chief function is determined from the following order of precedence: *"onium" compounds*,[2] *acid* (carboxylic first), *acid halide, amide, imide, aldehyde, nitrile, ketone, alcohol, phenol, mercaptan, amine, imine, ether, sulfide* (and *sulfoxide* and *sulfone*). Thus, hydroxybenzonitrile, not cyanophenol; aminophenol, not hydroxyaniline.

3. A multiple chief function is expressed where feasible as -diol, -dicarboxylic acid, etc , rather than as hydroxy—ol, carboxy—acid, etc. But amino and imino groups attached to cyclic bases are treated as substituents; as, aminopyridine.

4 The parent compound should be as large, and the substituents as small, as is practicable in conformity with the above rules; as, ethylbenzene, not phenylethane. But such names as diphenylethane and triphenylcarbinol are exceptions. When the chief function is in a side chain attached to a complex nucleus, "additive" names are preferred in order to harmonize 1 and 4; thus, naphthaleneacetic acid, not naphthylacetic acid (with the result that the compound is indexed with other naphthalene derivatives instead of under acetic acid; see 5).

5. The main part of the name with its functional ending, if any, is placed *first* in the index, the names of substituents following; thus, chloroacetic acid would appear in the index as *Acetic acid, chloro-* and dihydroxyanthraquinone as *Anthraquinone, dihydroxy-*. The part thus placed first is called the "index compound," it may or may not be the "parent compound" (in the second example the parent compound is anthracene).

6. Names in which two functions are expressed in the index compound, as propanolone, cyclopentanonecarboxylic acid, are avoided, except that a few very common ones, such as phenolsulfonic acid, are used (indicated by cross-references).

7. The names of the substituent radicals in the name of a compound are arranged *in alphabetical order;* as, *b*enzyl*e*thyl*m*ethyl*p*henylammonium chloride The number of radicals of each kind does not affect the order (*e. g.*, *benzyl* precedes *ethyl* no matter how many of each are present); but the compound name of a substituted radical is treated as a unit with its own alphabetic position; thus *dimethylamino*, Me_2N-, follows *benzyl* but precedes *ethyl*. When the complete name has been formed, it is alphabeted as any other word.

8. Parentheses, brackets and even braces are used where necessary to mark off complex radical names.

9. Familiar methods of numbering are employed (Greek letters for acids, alcohols, etc., and for side chains; arabic numerals for Geneva names and rings). The numbering of complex nuclei is shown in the index under the parent compounds; it is practically identical with that of Richter's "Lexikon" so far as that work goes

10. When two or more numberings are possible that one is chosen which gives the smallest number or numbers for the *chief function*, then for double bonds if these

[1] Patterson and Curran, *J. Am. Chem. Soc.* **39**, 1623–38(1917).
[2] Though "onium" does not designate a function in the strict sense, compounds of this type are often, though not always, named as though it were a chief function.

must be regarded, then for triple bonds, then for point of attachment (doubled molecules), then for substituents

11. Unnecessary numbers are avoided: thus, in Δ^3-1-cyclohexanol the 1 is not needed because by the rules in paragraph 10 the OH group is assumed to be in position 1.

12. Numbers in parentheses are used to indicate the position of entering hydrogen necessary to the existence of the compound; thus, 4(3)-quinolone is equivalent to 3,4-dihydro-4-ketoquinoline.

13. Doubled molecules or radicals are indicated by names commencing with *bi-* (as, *o,o'*-biphenol, biphenyl, $\Delta^{4,4'}$-bipiperidine). *Bis-* is used for like molecules united by a bivalent radical, as, methylenebisphenol.

In using the *cross-references*, the *general* nature of many of them should be kept in mind; thus, the reference "*Benzene, ethoxy-.* See *Phenetole*" is applicable not only to this compound itself but to derivatives, which are indexed under it rather than under *Benzene.*

ORGANIC RADICALS

An extensive list of preferred names for organic radicals was given in the 1916 Index in a place corresponding to this and also in the Introduction of the Decennial Subject Index. With few exceptions they are the ones in common use. Attention is here called merely to the preferred names for some radicals having more than one name in the literature and to some radical names recently adopted.

acenaphthenyl $C_{12}H_9$–
acetyl CH_3CO–
acridyl $C_{13}H_8N$–
acrylyl $CH_2.CHCO$–
amyl C_5H_{11}–
anisal *p*-$MeOC_6H_4CH$:
arsono $(HO)_2OAs$–
arsyl H_2As–
arsylene HAs:
asaryl 2,4,5-$(CH_3O)_3.C_6H_2$–
benzal C_6H_5CH:
benzenyl $C_6H_5C^{\cdot}$
benzilyl $Ph_2C(OH)CO$–
benzohydryl Ph_2CH–
boryl O:B–
1,4-butylene–$(CH_2)_4$–
camphanyl (*from camphane*) $C_{10}H_{17}$–
camphoroyl (*from camphoric acid*) $C_8H_{14}(CO)_2$:
camphoryl (*from camphor*) $C_{10}H_{15}O$–
camphorylidene (*from camphor*) $C_{10}H_{14}O$:
carbamido H_2NCONH–
carbamyl H_2NCO–
carbethoxy EtOOC–
carbomethoxy MeOOC–
cetyl $Me(CH_2)_{15}$–
cinnamal PhCH:CHCH:
cresotyl (*from cresotic acid*) 2,3-$(OH)(CH_3)C_6H_3CO$–
cresyl $(OH)MeC_6H_3$–
cumal *p*-$Me_2CHC_6H_4CH$:
epoxy –O–
ethinyl HC C–
ethylene –CH_2CH_2–
fenchyl (*from fenchyl alcohol*) $C_{10}H_{17}$–
fluorylidene (*from fluorene*) $C_{13}H_8$:
formyl OHC–
fural C_4H_3OCH:
furyl C_4H_3O–
furylidene (*2 isomers*) $\underset{4}{\dot{C}H}:\underset{5}{C}H.\underset{1}{O}.\underset{2}{C}H_2.\underset{3}{\dot{C}}:$
guanido $H_2N.C(:NH).NH$–
guanyl $H_2N.C(:NH)$–
hippuryl $PhCONHCH_2CO$–
indylidene (*from indole*) C_8H_7N:
isonitro HOON:
isonitroso HON:
isopropenyl $MeC(:CH_2)$–
keto O:
mercapto HS–
mesityl (*from mesitylene*) 3,5-$(CH_3)_2C_6H_3CH_2$–
methionyl –$SO_2CH_2SO_2$–
naphthal $C_{10}H_7CH$:
naphthylidene $C_{10}H_7$:
oxy –O–
perthio (*replacing O only*) S:S:
phenacyl $PhCOCH_2$–

phenacylidene PhCOCH:
phenanthrylene (*from phenanthrene*) $C_{14}H_8$:
phenylenedisazo $-N:NC_6H_4N:N-$
phthalidene (*from phthalide*) $C_6H_4CO\,OC=$
phthalidyl (*from phthalide*) $C_6H_4CO.O\,CH-$
piperonyl 3,4-$(CH_2O_2)C_6H_3\,CH_2-$
pivalyl (*from pivalic acid*) $(CH_3)_3CCO-$
propenyl $MeCH{\cdot}CH-$
propenylidene $CH_3CH:C.$
s-pseudocumyl 2,4,5-$(CH_3)_3.C_6H_2-$
pyranyl C_5H_5O-
pyridylidene $C_5H_5N:$
quinonyl $(O:)_2C_6H_3-$
quinoxalyl (*from quinoxaline*) $C_8H_5N_2-$
salicyl *o*-HOC_6H_4-
salicylal *o*-$HOC_6H_4CH:$
salicylyl *o*-HOC_6H_4CO-
selenyl $HSe-$
stannyl H_3Sn-
styryl $PhCH:CH-$
sulfinyl $OS:$
sulfonyl $O_2S.$
terephthalal (*from terephthalaldehyde*) $:HCC_6H_4CH{\cdot}$
thenoyl (*from thiophenecarboxylic acid, 2-isomers*) C_5H_3OS-
thienyl (*from thiophene*) C_4H_3S-
toloxy MeC_6H_4O-
toluino MeC_6H_4NH-
α-toluyl $PhCH_2CO-$
tolyl MeC_6H_4-
triazo N_3-
veratryl 3,4-$(CH_3O)_2C_6H_3.CH_2-$

RING INDEX

The following index of *ring complexes* is arranged as shown by the bold-face figures: Class I, with single figures indicating simple rings of 3, 5, etc., members; Class II, two figures denoting double rings of 3 and 4, 3 and 5, etc., members; then the triple and still more complex rings. Under each combination of figures the kind and number of atoms in the ring or rings are expressed in formulas. These formulas are arranged so that their initial rings are in the same order as in the Formula Index (see Key at the beginning of it). If the initial rings are alike the second rings of the formula are considered, and so on. By this means the reader will be able to learn the name used in the index for the simplest parent compound containing any particular ring or combination of rings and by turning to this name in the index he will find the compounds listed and, perhaps, cross-references to names of derivatives. Rings which are united but which have no atoms in common (*e. g.*, biphenyl) and "spiro" compounds[1] which are characterized by two rings having but one atom in common are not regarded as ring complexes nor included in this index.

To illustrate: **6,6,6,** C_4N_2-C_6-C_6 Benzoquinoxaline
Phenazine

(1) This designates a complex ring of three components, each of six members; (2) the first is heterocyclic, containing four carbon atoms and two nitrogen atoms and the other two are carbocyclic rings of six atoms each; (3) parent compounds of this configuration will be found in the index under the two names given. If derivatives are indexed a structural formula will be found with the proper numbering and also appropriate cross-references to derivs. having other common names, if any such are in the index.

It should be noted that the classification is made with reference to the smallest rings which, placed together, will constitute the plane formula. Thus hexamethylenetetramine is treated as a 6,6,6 complex although a fourth six-membered ring (composed of atoms from the three six membered rings) is also present.

I
3 As_3. Triarsine, cyclic triphenyl-*
C_2O. Ethylene oxide
C_2S. Ethylene sulfide
C_3. Cyclopropane
Cyclopropene
4 C_2NO. Dimethylene-1,2-oxaimine*
C_4. Cyclobutane

[1] All members of this class will be found together under "Spiro-" in the Subject Index.

5 As_5. Pentarsenole
CN_4. Tetrazole
C_2NS_2. Dithiazole
C_2N_2O. Oxdiazole
C_2N_2P. Diazphospholium*
C_2N_2S. Thiodiazole
C_2N_3. Triazole
C_3NO. Isoxazole
Oxazole
C_3NS Thiazole
C_3N_2. Imidazole
Pyrazole
C_3O_2. Dioxole
C_4N Isopyrrole
Pyrrole
C_4O Furan
C_4S. Thiophene
C_4Se Selenophene
C_5 Cyclopentadiene
Cyclopentane
6 CN_5 Pentazine
$C_2N_2O_2$. Dioxdiazine
C_2N_4. Tetrazine
C_3N_2O. Isoxdiazine
Oxdiazine
C_3N_2S. Isothiodiazine
Thiodiazine
C_3N_3. Triazine
C_3OS_2 Dithiotriacetaldehyde*
C_3O_2P 1,3 Propanediol, 2-(hydroxymethyl) 2-nitro , cyclophosphates, 2308[7]
C_3O_2S Monothiotriacetaldehyde*
C_3S_3. Trithiane
C_4NO Isoxazine
Oxazine
C_4NS Thiazine
C_4N_2. Pyrazine
Pyrimidine
C_4OS. Thioxane
C_4O_2. Dioxin
C_4S_2 Dithiane
C_5N Piperidine
Pyridine
C_5O. Pyran
Pyrylium
C_5S. Thiopyran
C_5Te. Telluropyran
C_6. Benzene
Cyclohexane
Cyclohexene
N_4P_2. Tetrazdiphosphinium*
7 C_3N_4. Benzil cyclic thiocarbohydrazone, 1810[7]
C_4N_2O. Carbazic acid, β (γ-hydroxypropyl)-β-phenyl-, lactone
C_5S_2. Trithiodiacetylacetone cyclodisulfide(?)*
C_7. Cycloheptane
8 C_6O_2. Succinic acid, glycol cyclic ester
C_8 Cycloöctane
Cycloöctene
9 C_9. Cyclononane
10 C_{10}. Cyclodecane
11 C_{11}. Cyclohendecane
12 C_{12}. Cyclododecane
13 C_{13}. Cyclotridecane
14 C_{14} Cyclotetradecane
15 C_{15} Cyclopentadecane
16 C_{16}. Cyclohexadecane
17 C_{17}. Civetone
Cycloheptadecane
18 $C_{17}N$. Cycloheptadecanone, isoxime, 1791[9]
C_{18}. Cycloöctadecane

II
3, 4 C_2O-C_3O. Ethylene oxide - α - carboxylic acid, β-hydroxy-α,β-diphenethyl-, lactone, 1798[6]
C_3-C_4. Bicyclo[0.1.2]pentane
3, 5 C_3-C_5. Bicyclo[0.1.3]hexane
Sabinane
3, 6 C_2Hg-C_6. Aniline, 2-chloro-4,5-mercuri-
C_2N-C_6. Glutaric acid, α-(2,3-iminophenyl)-
C_2O-C_6. Cyclohexane, 1,2-epoxy-
C_3-C_6 Norcarane
4, 5 CN_2O CN_4. C - Hydroxydiphenyltetrazolium betaine*
CN_2S CN_4 Diphenyltetrazolium thiobetaine*
CN_3 CN_4. Iminodiphenyltetrazolium betaine*
C_4 C_5 Cyclopentacyclobutene
4, 6 C_2HgO C_6. Benzenesulfonic acid, p-(3 hydroxymercuri - 2,5-cresylazo)-,2′,3′ anhydride, Na salt
Benzoic acid, o(and p)-(3-hydroxymercuri - 2,5 - cresylazo)-, 2′,3′ - anhydride
C_2S_2-C_6. o Phenylene disulfide
C_3Hg-C_6 Aniline, 2-chloro-4,6 mercuri
C_3N-C_6. Benzazete
5, 5 C_2N_3-C_4O. Furotriazole
C_3N_2-C_3N_2 Glycoluril
C_3O_2 C_5 Cyclopentadioxole
C_4As C_4As. Arsinic acid, p phenylene *
C_4N-C_4O. 3,4-Furandicarboximide, 2,5-diphenyl-
Furopyrrole
C_5 C_5 Norcamphane
5, 6 CN_4 CN_4O. Isomer, m. 154–5°, of nitrosoiminodiphenyltetrazolium betaine*, 1224[5]
C_2BrN_2 C_6 Compd. from N-phenyl-o-phenylenediamine and $HBrO_3$, 1239[5]
C_2IN_2-C_6. Piaziodonium compds.*, 1239[3,4]
C_2NS_2-C_6. o-Benzenedisulfonimide
C_2N_2P-C_6. Benzodiazphospholium*
C_2N_2Se-C_6 Piaselenole
C_2N_3-C_6 Benzotriazole
C_2OS_2-C_6. o-Benzenedisulfonic anhydride
C_2S_3-C_6. Benzotrisulfole
C_3NO-C_6. Anthranil
Benzisoxazole
Benzoxazole
C_3NS-C_6. Benzisothiazole
Benzothiazole
C_3N_2-C_4N_2. Purine
C_3N_2-C_5N. Imidazopyridine
C_3N_2-C_6. Benzimidazole
Indazole
Isoindazole
C_3OS-C_6. Benzisothioxole
C_3O_2-C_6. Carbonic acid, thiono-, pyrocatechol ester
Piperonal, etc.
C_3S_2-C_6. 1,3-Benzdithiole-1-sulfonium*
Benzodisulfole
C_4N-C_4N_2. Pyrrolopyrazine
Pyrrolopyridazine
C_4N-C_5N. Nortropidine
Pyrrolopyridine
C_4N-C_6. Indole
Isoindole
Pseudoindole

C_4O-C_5N. Pyridisofuran
C_4O-C_6. Benzofuran
Isobenzofuran
C_4S-C_6. Isothionaphthene
Thionaphthene
C_5-C_5N. Camphidine
C_5-C_5O. Campholide
C_5-C_6. Indene
6,6 C_3HgOS-C_6. Benzoic acid, *o*-mercapto, cyclic Hg deriv.
p-Toluenesulfonic acid, 3-(hydroxymercuri)-, cyclic anhydride
C_3N_2O-C_6. Isobenzoxdiazine
C_3N_2S-C_6. Isobenzothiodiazine
C_3N_3-C_6. Benzotriazine
C_3O_2P-C_3O_2P. 1,3-Propanediol, 2-(hydroxymethyl)-2-nitro-, bicyclophosphate, 2307[9]
C_4NO-C_6. Benzisoxazine
Benzoxazine
C_4NS-C_6. Benzothiazine
C_4N_2-C_6. Phthalazine
Quinazoline
Quinoxaline
C_4OS-C_6. Thiosalicylic phthalidene ether ester*
C_4O_2-C_6. Benzodioxin
C_4S_2-C_6. Benzodithiin
C_5As-C_6. Arsinoline
C_5N-C_5N. Quinuclidine
C_5N-C_6. Isoquinoline
Quinoline
C_5O-C_6. Benzopyran
Benzopyrylium
C_5S-C_6. Benzothiopyran
C_6-C_6. Bicyclo[2.2.2]octane
Naphthalene
6,7 C_4N_2-C_3N_4. Alloxan cyclic thiocarbohydrazone, 1810[8]
C_6-C_4N_2O. 4,5-Benzo[hept-1,2,6-oxdiazine]
C_6-C_4N_3. Benzoheptatriazine*
C_6-C_5N_2. Benzenearsonic acid, 3,4-malonyl diamino-
C_6-C_6N. Benzoic acid, *o*-(γ-aminopropyl)-, lactam
Homotetrahydroisoquinoline*
sym-Homotetrahydroisoquinoline*
α-Toluic acid, *o*-(β-aminoethyl)-, lactam
C_6-C_6S. Homoisothiochroman*
C_6-C_7. Benzocycloheptadiene

III
3,5,5 C_3-C_5-C_5. Tricyclo[2.2.1.0^{2,6}]heptane
3,5,6 C_2N-C_4N-C_6. Tricycloindole
4,5,5 C_4-C_5-C_5. Dicyclopentadiene*
5,5,6 C_2N_3-C_2N_3-C_6. Benzobitriazole
C_2N_3-C_4N-C_6. Triazolindole
C_3NS-C_3NS-C_6. Benzobisthiazole
C_3N_2-C_3N_2-C_6. Imidazoindazole
C_3N_2-C_5-C_6. Indenopyrazole
C_3O_2-C_5-C_6. 1-Indanone, 6,7-methylenedioxy-
C_4N-C_4N-C_6. Isophthalic acid, 4,6-bis-(aminomethyl)-, di-γ-lactam
Pyrroloindole
Terephthalic acid, 2,5-bis(aminomethyl)-, di-γ-lactam
C_4O-C_4O-C_6. Isophthalic acid, 4,6-bis-(hydroxymethyl)-, di-γ-lactone
Terephthalic acid, 2,5-bis-(hydroxymethyl)-, di-γ-lactone
C_5-C_5-C_6. Indacene
5,5,7 C_5-C_5-C_3N_4. Camphorquinone cyclic thiocarbohydrazone, 1810[8]
5,6,6 C_2N_2O-C_6-C_6. Naphthoxdiazole
C_2N_3-C_6-C_6. Isonaphthotriazole
Naphthotriazole
C_3NS-C_5N-C_6. Thiazoloquinoline
C_3NS-C_6-C_6. Naphthisothiazole
Naphthothiazole
C_3N_2-C_3N_3-C_6. Imidazobenzotriazine
C_3N_2-C_5O-C_6. Coumarpyrazoline*
4-Pyrazolecarboxylic acid, 5-methyl-1-phenyl-3-salicyl-, lactone
C_3N_2-C_6-C_6. Naphthisopyrazole
C_3O_2-C_5N-C_6. Isoquinoline, 6,7-methylenedioxy-
C_3O_2-C_5O-C_6. 1,4-Benzopyran, 4-(3,4-dimethoxyphenyl)-5,7-dimethoxy-2,3-methylenedioxy-
C_4N-C_5N-C_6. Pyridindole
Pyrroloisoquinoline
C_4N-C_6-C_6. Carbazole
Naphthazole
C_4O-C_6-C_6. Dibenzofuran
Naphthofuran
C_4S-C_6-C_6. Dibenzothiophene
Naphthothiophene
C_5-C_4N_2-C_6. Cyclopentaquinoxaline
C_5-C_5O-C_6. Indenopyran
C_5-C_6-C_6. Acenaphthylene
Fluorene
Isofluorene
6,6,6 $C_2N_2O_2$-C_6-C_6. 1,2-Naphthoquinone, 4-nitro-, dioxime peroxide
C_2N_4-C_6-C_6. Isonaphthotetrazine
C_3N_2O-C_5O-C_6. Benzopyranoxdiazine
C_3N_3-C_3N_3-C_3N_3. Hexamethylenetetramine
C_4AsN-C_6-C_6. Phenarsazine
C_4AsO-C_6-C_6. Phenoxarsine
C_4AsS-C_6-C_6. Phenothiarsine
C_4Hg_2-C_6-C_6. Aniline, 4,4′,5,5′-dimercuribis[2-chloro-
C_4NO-C_6-C_6. Isophenoxazine
Naphthisoxazine
Naphthoxazine
Phenoxazine
C_4NS-C_4NS-C_6. Benzobithiazine
C_4NS-C_6-C_6. Isophenothiazine
C_4N_2-C_6-C_6. Benzoquinoxaline
Phenazine
C_4OTe-C_6-C_6. Phenoxtellurine
C_4S_2-C_6-C_6. Thianthrene
C_5N-C_5N-C_6. Phenanthroline
C_5N-C_6-C_6. Acridine
Benzisoquinoline
Benzoquinoline
Phenanthridine
C_5O-C_5O-C_6. Benzodipyran
C_5O-C_6-C_6. Isoxanthene
Naphthopyran
Xanthene
C_5S-C_6-C_6. Naphthothiopyran
C_5Te-C_6-C_6. Telluroxanthene

C_6-C_6-C_6. Anthracene
Phenanthrene
6,6,7 C_6-C_6-C_5N_2. Naphthalic acid, cyclic hydrazide
6,6,8 C_6-C_6-C_6Hg_2. Aniline, 2,2′,4,4′-dimercuribis[6-chloro-
C_6-C_6-C_6N_2. Diphenic acid, cyclic hydrazide, 2672[5]
C_6-C_6 C_6S_2. Phthalic acid, dithiol-(4 - bromo-o phenylene) cyclic ester, 1797[9]

IV
3,4, C_2O-C_4-C_5-C_5 Dicyclopentadiene oxide*
3,6, C_3-C_6-C_6-C_6. Thebaine deriv., 765[9]
5,5, C_2N_3-C_5 C_6-C_6. Acenaphthotriazole
C_4N C_5 C_6-C_6 Indenoindole
C_4O C_4O C_6 C_6 1,2 - Ethanediol, 1,2 - bis(2-hydroxy-p-anisyl)-1 - methoxy-2-phenyl-, anhydride
1,1,2 - Ethanetriol, 2 - p-anisyl-1,2-bis(2,4 - dihydroxyphenyl), anhydride
1,1,2 - Ethanetriol, 1,2 bis(2,4 -dihydroxyphenyl)-2 phenyl, anhydride
C_5 C_5-C_6 C_6. Indenoindene
5,6,6,6 C_2IN_2-C_4N_2-C_6 C_6 Compd from 2,3 -diaminophenazine and HIO_3, 1239[1]
C_2N_3-C_4N_2-C_6-C_6 Triazolophenazine
C_2N_3-C_6-C_6-C_6. Phenanthrotriazole
C_2O_2S C_6-C_6 C_6. Anthragallol, 2,3-sulfite
Hystazarin, 2,3-sulfite
Purpurin, 1,2-sulfite
C_3N_2-C_4N_2-C_6 C_6 Imidazophenazine
C_3N_2-C_5N-C_6-C_6 Imidazobenzisoquinoline
C_4N C_4N_2 C_6-C_6 Indoloquinazoline
Pyrazinocarbazole
C_4O-C_5O-C_6-C_6. 1 - Xanthenecarboxylic acid, 2,3,4 -trichloro-9,9-dihydroxy - 5-methyl-, lactone
C_4S-C_6-C_6-C_6 Anthrathiophene
C_5-C_4N_2-C_6-C_6 Cyclopentabenzoquinoxaline
C_5-C_5N-C_6-C_6. Indenoquinoline
C_5-C_5O-C_6-C_6. Indenobenzopyrylium
5,6,6,7 C_5-C_6-C_6-C_3N_4. Acenaphthenequinone cyclic thiocarbohydrazone, 1810[7]
6,6,6,6 C_4NO-C_6-C_6-C_6. Isobenzophenoxazine
C_4NS-C_6-C_6-C_6. Benzophenothiazine
C_4N_2-C_4N_2-C_6-C_6 Quinoxaloquinoxaline
C_4N_2-C_6-C_6-C_6. Benzophenazine
C_4S_2-C_4S_2-C_6-C_6. Glyoxaldibromodithiocatechol*
C_5N-C_5N-C_6-C_6. Dibenzoquinolizine
Diphenic acid 3,5,-3′,5′-tetraamino-, dilactam
Paraberine
C_5N-C_6-C_6 C_6. Benzacridine
Naphthoquinoline
C_5O-C_5O-C_6-C_6. 2,3-[7 Methoxychromeno(4,3)]-6,7-dimethoxybenzopyrylium ferrichloride*, 2326[3]
C_6-C_6-C_6 C_6. Benz

V
3,3,4,5,5 C_2O-C_2O-C_4-C_5 C_5 Dicyclopentadiene dioxide*
C_3-C_3-C_4-C_5-C_5. Hydrocarbon from reduction of isophorone, m. 112°, 1784[5]
3,5,6,6,6 C_3-C_4O-C_6-C_6-C_6 Thebaine deriv., 765[9]
4,4,5, ,5 C_4-C_4 C_5-C_5 C_5 Tricyclopentadiene*
4,5,5, 6 C_2N_2-C_4N-C_4N-C_6-C_6 Diindolourete
C_4-C_5 C_5-C_6-C_6 Truxene
5,5,5, 6 C_4S-C_5 C_5-C_6 C_6 Diindenothiophene
5,5,6, 6 C_3N_2-C_4N-C_6-C_6-C_6 Isoindolonaphthimidazole
C_4N-C_4N-C_4N_2-C_6-C_6. β - Isatoid, tetramethyl-*
C_5-C_5 C_4NS-C_6-C_6. Diindenothiazine
C_5-C_5-C_4S_2-C_6 C_6. Diindenodithiin
C_5-C_5-C_6-C_6-C_6 Benzodiindene
5,6,6,6 6 C_2N_3-C_4N_2-C_6-C_6-C_6 Benzotriazolophenazine
C_3NO-C_5N-C_5N-C_6-C_6. Palmatrubine
C_3N_2-C_5N C_6-C_6-C_6. Benzimidazobenzisoquinoline
C_3O_2-C_5N-C_5N-C_6-C_6. Nandinine
Paraberine, methylenedioxy-
Pseudonandinine
C_3O_2 C_5N-C_6-C_6-C_6 Dicentrine
C_4O-C_6-C_6-C_6-C_6. Dinaphthofuran
6,6,6,6,6 C_4AsN-C_6-C_6-C_6-C_6 Dibenzophenarsazine
C_4N_2-C_4N_2-C_6-C_6-C_6 Quinoxalophenazine
C_4N_2-C_6-C_6-C_6-C_6. Dibenzophenazine
C_4OS C_6-C_6-C_6-C_6. Dibenzophenothioxin
C_5N-C_6-C_6-C_6-C_6. Dibenzacridine
C_6-C_6-C_6-C_6-C_6. Dibenzanthracene
Perylene

VI
5,5,6,6,6,6 C_2N_3 C_5-C_4N_2-C_6-C_6-C_6. Triazolacenaphthoquinoxaline
C_3NO-C_3O_2-C_5N-C_5N-C_6-C_6. Berberrubine
C_4N_2-C_4N-C_4N_2-C_6-C_6-C_6 o-Benzoylene - 2,3 - phenazinoiminazole*
C_3N_2-C_5-C_4N_2-C_5N-C_6-C_6. o-Camp -

phoroylene - 2,3 - phenazinoiminazole*
C_3O_2-C_3O_2-C_5N-C_5N-C_6-C_6. Protoberberine, bismethylenedioxy-*
5,6,6,6,6,6 C_2N_3-C_4N_2-C_6-C_6-C_6-C_6. 6,7-Phenanthrazinoindazole*
C_3N_2-C_5N-C_6-C_6-C_6-C_6. Naphthimidazobenzisoquinoline
6,6,6,6,6,6 C_4NO-C_4NO-C_6-C_6-C_6-C_6. Di-Meldola's blue*
C_4N_2-C_6-C_6-C_6-C_6-C_6. Tribenzophenazine

VII
4,4,4,5,5,5,5 C_4-C_4 C_4 C_5-C_5-C_5 C_5. Tetracylopentadiene*
5,5,5,6,6,6,6 C_4S-C_5-C_5-C_6-C_6-C_6-C_6. Diacenaphthothiophene
C_5-C_5-C_5-C_6-C_6-C_6-C_6. Truxene
5,6,6,6,6,6,6 C_3N_2-C_4N_2 C_5N-C_6 C_6-C_6-C_6. *o* Naphthoylene-2,3-phenazinoiminazole*
5,6,6,6,6,6,7 C_3N_2-C_4N_2-C_6-C_6-C_6-C_6-C_6N. *o*-Diphenoylene-2,3-phenazinoiminazole*
6,6,6,6,6,6,6 C_4N_2-C_4N_2-C_4N_2-C_6-C_6-C_6 C_6. Diquinoxalophenazine
C_4N_2-C_6-C_6-C_6-C_6-C_6-C_6. Indanthrene
Phenanthrazine
C_6-C_6-C_6-C_6-C_6-C_6-C_6. Benzodianthrene

VIII
6,6,6,6,6,6,6,6 C_5N-C_5N C_6 C_6-C_6-C_6-C_6-C_6. Flavanthrene

IX
4,4,4,4,5,5,5,5,5 C_4-C_4-C_4-C_4-C_5-C_5 C_5-C_5-C_5. Pentacyclopentadiene*
6,6,6,6,6,6,6,6,6 C_6-C_6-C_6-C_6-C_6-C_6-C_6-C_6-C_6. Isoviolanthrone
Violanthrone

X

C_5-C_5-C_5-C_6-C_6-C_6-C_6-C_6-C_6-C_6. Decacyclene

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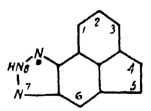

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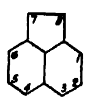

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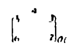

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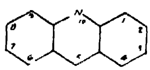

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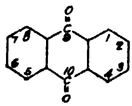

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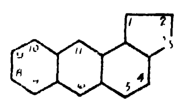

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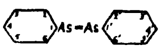

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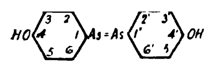

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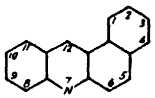

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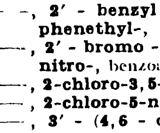

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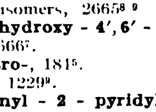

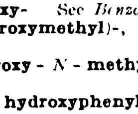

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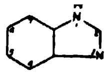

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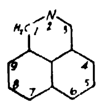

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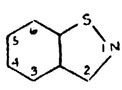

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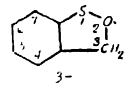

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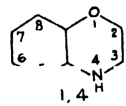

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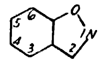

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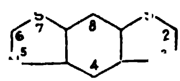

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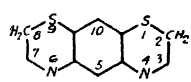

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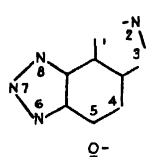

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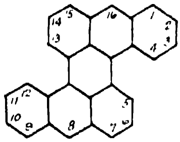

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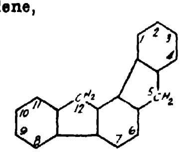

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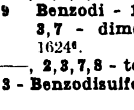

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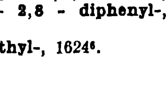

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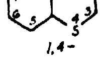

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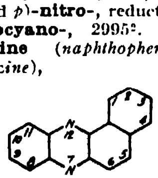

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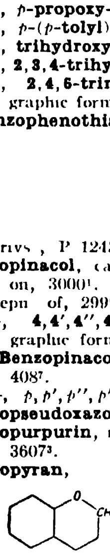

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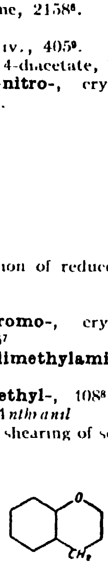

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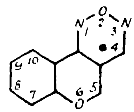

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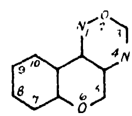

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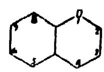

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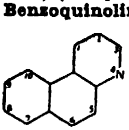
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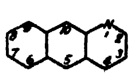
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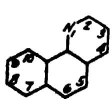
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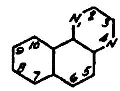
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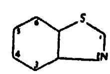

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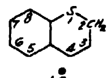
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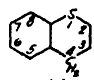
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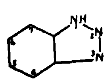

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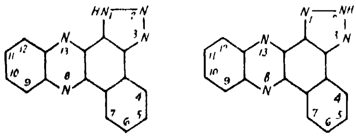

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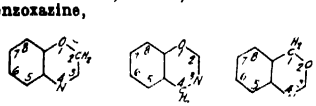

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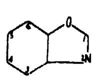

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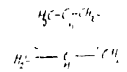

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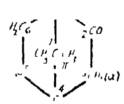

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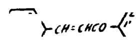

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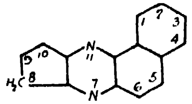

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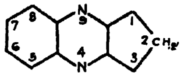

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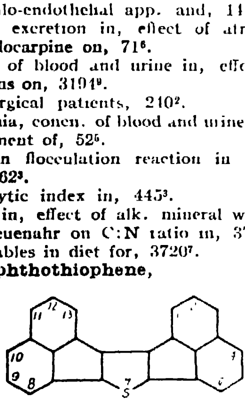

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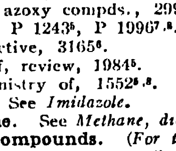

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$\gamma\gamma'$-**Dibenzacridine-14-carboxylic acid**, 598^{1}.
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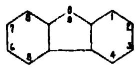

3 - Dibenzofuranol, 1,2,3,4,4₁,9₁-hexahydro-6,9₁-dimethyl-(?), and carbanilate, 400[6,7].
3(4) - Dibenzofuranone, 4₁,9₁-dihydro-6,9₁-dimethyl-(?), 400[6].
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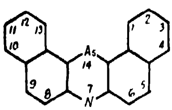
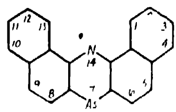


αα'-



γγ'-

αα' - **Dibenzophenarsazine, 14-chloro-7,14-dihydro-,** 1606[7].
γγ' - **Dibenzophenarsazine, 7-chloro-7,14-dihydro-,** 1606[7].
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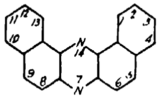

—, **5,9-diacetamido-,** 603[1].
—, **5,9-diamino-,** 603[2].
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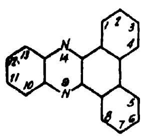

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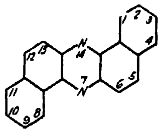

—, **5,12-diacetamido-,** 603[2].
—, **5,12-diamino-,** 603[2].
5 - αα' - Dibenzophenazinol, 9-amino-, di-HCl, 603[3].
5 - αγ' - Dibenzophenazinol, 1,2-amino-, di-HCl, 603[3].
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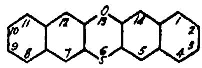
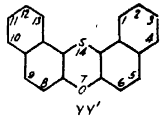


ββ'



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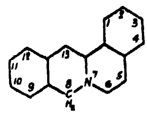

——, **2,3,9,10-tetramethoxy-.** See *Palmatine.*
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9 - Dibenzoquinolizinol, 5,6,13,13₁-tetrahydro - 10 - methoxy-2,3-methylenedioxy-. See *Nandinine.*
10 - Dibenzoquinolizinol, 5,6,13,13₁-tetrahydro - 9 - methoxy - 2,3-methylenedioxy-. See *Pseudonandinine.*
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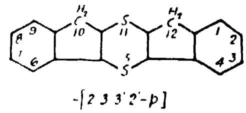

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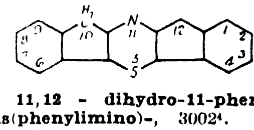

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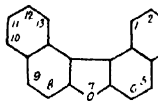

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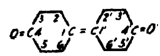

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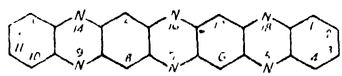

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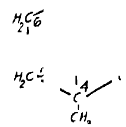

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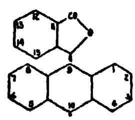

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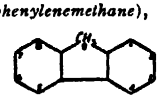

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(O.CO.C(:CH_2).C(:CH_2).CO)
1 2 3 6 4 7 5

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CH:CH.CH:CH.C(:CH_2)
1 2 3 4 5 6

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(O CH CH.CH·CH)
1 2 3 4 5

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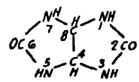

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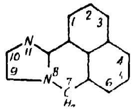

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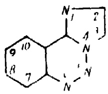

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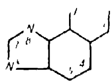

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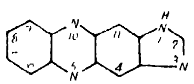

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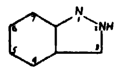

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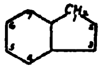

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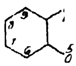

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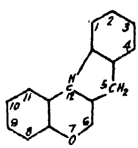

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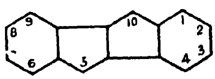

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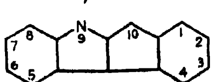

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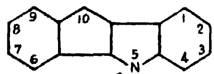

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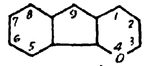

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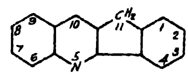

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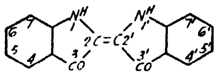

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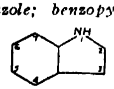

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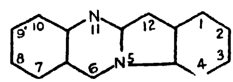

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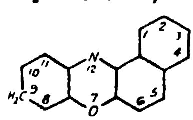

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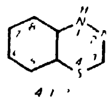

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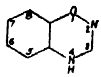

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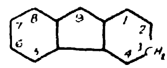

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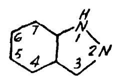

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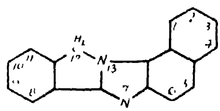

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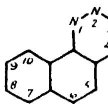

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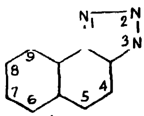

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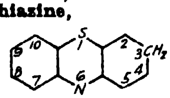

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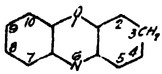

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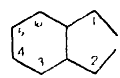

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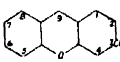

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1 2 3 4 5 6

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(O CH:CH.NH.CH·CH)
1 2 3 4 5 6

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1 2 3 4 5

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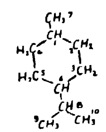

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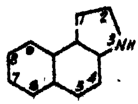

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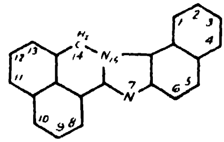

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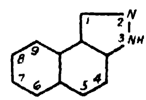

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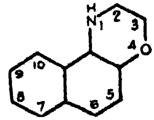

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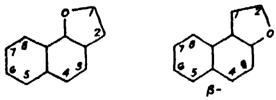

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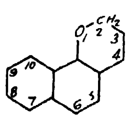
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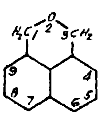
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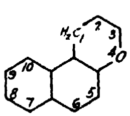
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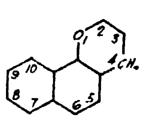
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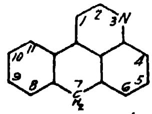
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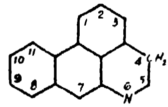
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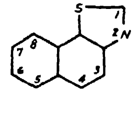

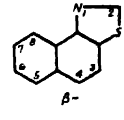
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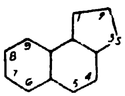

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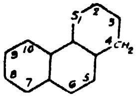

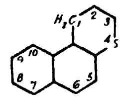

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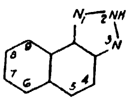

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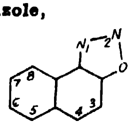

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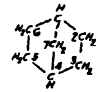

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O.CH$_2$.CH:N.CH:CH
1 2 3 4 5 6

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(O.N:CH.CH$_2$.CH.CH)
1 2 3 4 5 6

1,3,4-Oxazine,

(O.CH:N.CH$_2$.CH.CH)
1 2 3 4 5 6

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(O.N:CH.CH:CH.CH$_3$)
1 2 3 4 5 6

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(O.CH:N.CH:CH)
1 2 3 4 5

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(O.CH$_2$ N:N.CH:CH)
1 2 3 4 5 6

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(O.N:CH.N:CH)
1 2 3 4 5

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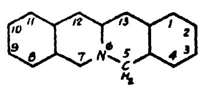

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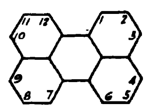

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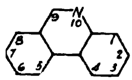

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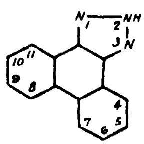

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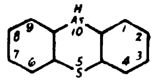

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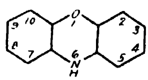

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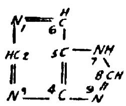

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(O CH₂.CH.CH CH CH)
1 2 3 4 5 6

1,4-Pyran,

(O CH·CH CH₂ CH.CH)
1 2 3 4 5 6

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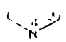

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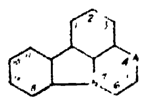

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(NH.N·CH.CH·CH)
1 2 3 4 5

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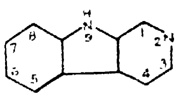

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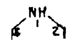

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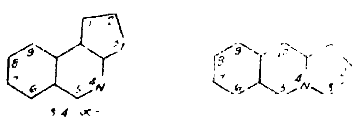

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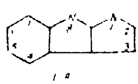

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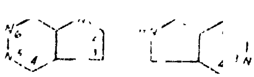

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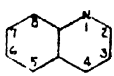

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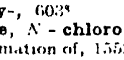

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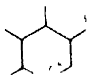

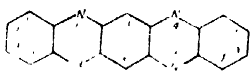

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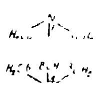

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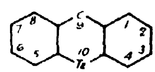

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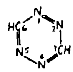

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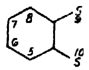

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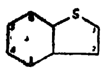

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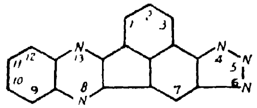

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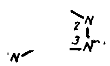

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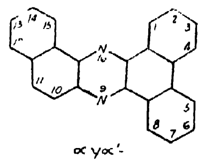

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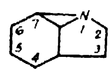

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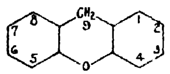

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III. FORMULA INDEX

KEY.

In using this index the following should be borne in mind:

1. The Formula Index is **supplementary** to the Subject Index; in no sense does it replace any part of the latter except that most of the organic compounds that were not named in the original papers are entered in the former only.

2. **Inorganic as well as organic compounds** have been entered.

3. **Entries under their own formulas** are made for all strictly inorganic and strictly organic compounds and for the true organic derivatives of organic compounds, both addition compounds and true reaction derivatives (this includes esters, hydrazones, methohalides, oximes, picrates, semicarbazones, etc.). Inorganic salts of organic acids and inorganic addition compounds of organic compounds (hydrohalides, chloroplatinates, perchlorates, sulfates, etc.) are not given separate entries but are indicated in modifying phrases under the formulas of the compounds from which they are derived (under the acid in the case of a salt). Salts of formic, acetic and oxalic acids are exceptions; these are entered as such.

4. The **arrangement of symbols in formulas** is alphabetical except that in carbon compounds C always comes first, followed immediately by H if hydrogen is also present.

5. The **arrangement of formulas** is also alphabetical except that the number of atoms of any specific kind influences the order of compounds. *E. g.*, all formulas with 1 C come before those with C_2, thus: CCl_2O, CCl_4, $CHCl_3$, CHN, CHNO, CH_2Br_2, CH_2O, CH_3Cl, CO, C_2Ca, $C_2H_4O_2$.

6. The **arrangement of entries under any heading** is strictly alphabetical according to the preferred names of the isomers.

7. **Entries consist of** (*a*) the formula (in bold-face type), (*b*) the name as it has been entered in the Subject Index (in light-face Roman type; *it should be noted particularly that the part of the entry in this type is the exact equivalent of the formula given*), (*c*) occasionally a modifying phrase or word such as "Ca salt" or "hydrochloride" (in italics, different type being used to set off that part of a compound being indexed which is not represented in the formula used; see ¶ 3 above), (*d*) the page reference, and (*e*) the fraction of the page in ninths (indicated by a small superior numeral) in which the compound will be found.

8. **Cross-references** are to the Subject Index.

9. **Water of hydration** is not made a part of the formulas indexed but is usually given in light-face type following the formulas.

10. **Polymers** having different names and recognized as different substances, *e. g.*, acetaldehyde and paraldehyde, are all entered under their accepted formulas. But definite compounds for which different polymeric formulas are in use are entered under the simplest formula only with cross-references under the polymeric formulas.

11. **A straight line,** thus ———, used under some headings to avoid repetition of names, always stands for the name of the "index compound," *i. e.*, that part of the preceding name (inverted) which comes before the comma.

12. "P" before a page number indicates that the abstract is of a **patent.**

13. The **names beryllium** (Be), **columbium** (Cb) **and hafnium** (Hf) are given preference over glucinum (Gl), niobium (Nb) and celtium (Ct), respectively, for these elements.

The Key to a formula index is necessarily lengthy. It would not be correct to conclude from this that this index is difficult to use. Experience is to the contrary.

INTRODUCTION.

General purpose and policy. The location of chemical compounds in an index by names is at times uncertain because names vary and in the case of complex compounds may be difficult to ascertain. New compounds are constantly being prepared, which, if named at all, may receive more than one name which is justified from one point of view or another and the possibilities of incorrect names are great. Since the kinds and number of component atoms of a chemical compound are unvarying characteristics the supplementary Formula Index to *Chemical Abstracts* is published for the purpose of eliminating this element of uncertainty in the Subject Index. Except that many unnamed compounds are no longer entered under the heading "Compound," the Subject Index is in no way altered on account of the Formula Index. In the Subject Index related compounds are *grouped* rather effectively and to good use by the present system of indexing on the basis of "parent compounds" or more accurately "index compounds;" in the Formula Index the certain location of *individual* compounds is the primary consideration. The Subject Index is more convenient to use in some respects and it frequently contains more information in the form of modifying phrases. The repetition of modifying phrases in the Formula Index beyond necessary brief phrases to indicate derivatives has been avoided as unnecessary for the accomplishment of the real purpose of this index, as stated above, and as inconsistent with necessary economy. Isomerism is not indicated in the Formula Index in cases in which the names differ only in position numbers or letters but it always is in the Subject Index when known. Ready reference to the Subject Index for the purpose of locating information regarding related compounds is made possible by the use in the Formula Index of names following the formulas written exactly as they appear in the former index.

All new compounds and all compounds for which new data are given have been entered. Most of the compounds have been entered under their own formulas. Some departure from a policy of making separate formula entries for derivatives of all kinds is reasonable and accords with custom. The only departures in this index (see ¶3

of the Key) have been in classes of compounds the natures of which would be more than likely apparent to the investigator. The interest in a salt of a complex organic acid, for example, is likely to be mainly in the acid and it is considered more valuable to have the record of it under the formula of the acid for the use of searchers looking up that acid.

In the case of unnamed organic compounds where possible the class, as acid, source and melting or boiling point have been given.

Cross-references to the Subject Index have been used for all simple inorganic compounds, for all minerals of definite composition and for the organic compounds more commonly met with, in general whenever it seemed likely that users of *Chemical Abstracts* would predominatingly refer to the Subject Index.

The system. The system, as described in the Key, is, with slight modifications, that worked out by Dr. Edwin A. Hill[1] and used by the Classification Division of the U. S. Patent Office. This system is preferred to the system of Richter's Lexikon because of its greater simplicity and its applicability with equal fitness to inorganic as well as to organic compounds.

$AgAuCl_4$ Silver chloroaurate, 2110^{6}.
$AgBr$ See *Silver bromide.*
$AgCl$ See *Silver chloride.*
$AgClO_4$ See *Silver perchlorate.*
$AgCl_2Na$ Silver sodium chloride, 2603^{8}.
AgF See *Silver fluoride.*
$AgHO$ See *Silver hydroxide.*
$AgH_4N_3O_6$ Ammonium silver nitrate, 2770^{6}.
AgI See *Silver iodide.*
$AgIO_3$ Silver iodate, 1162^{1}.
$AgMnO_4$ See *Silver permanganate.*
$AgNO_3$ See *Silver nitrate.*
AgN_2O_6Tl Silver thallium nitrate, 1553^{1}, 2770^{6}.
$AgZn$, 1023^{2}.
Ag_2CO_3 See *Silver carbonate.*
$Ag_2C_2O_4$ Silver oxalate, 1163^{2}.
Ag_2CrO_4 See *Silver chromate.*
$Ag_2Cu_3H_6N_2O_{12}$, 879^{8}.
$Ag_2F_5FeH_2O$ + $2H_2O$ Silver pentafluoaquoferrate, 719^{7}.
Ag_2FeO_4 See *Silver ferrate.*
$Ag_2Na_4O_9S_6$ + $2H_2O$ Transargan, 3740^{9}.
Ag_2O See *Silver oxides.*
Ag_2O_2 See *Silver oxides.*
Ag_2O_4S See *Silver sulfate.*
Ag_2O_4U Silver uranate, 3657^{3}.
$Ag_2Pb_5S_{11}Sb_2$ See *Fizelyite.*
Ag_2S See *Argentite; Silver sulfide.*
Ag_2Zn_3, 2141^{4}.
Ag_3Bi See *Silver bismuthide.*
$Ag_3Cl_6H_4N_2O_2Rh$, 2625^{8}.
Ag_4Sn, 1768^{1}.
$AlBr_3$ See *Aluminum bromide.*
$AlBr_3H_2S$, 322^{4}.
$AlCl_3$ See *Aluminum chloride.*
$AlCl_4Na$ Sodium phosgeno-aluminate, 534^{9}.
AlF_3 See *Aluminum fluoride.*
$AlF_6H_6N_3$, 719^{5}.
AlF_5K_2 + $2H_2O$, 719^{6}.
AlF_6Na_3 See *Cryolite.*
$AlHO_2$ See *Diaspore.*
$AlHO_6Si_2$ See *Pyrophyllite.*
AlH_3O_3 See *Aluminum hydroxide; Hydrargillite.*
AlI_3 See *Aluminum iodide.*
$AlKO_8S_2$ + $12H_2O$ See *Alums.*
$AlLiO_6Si_2$ See *Spodumene.*
AlN See *Aluminum nitride.*
AlN_3O_9 See *Aluminum nitrate.*
$AlNaO_2$ See *Sodium aluminate.*
$AlNaO_4Si$ See *Carnegieite.*
$AlNaO_8S_2$ + $12H_2O$ See *Alums.*
$AlNaO_8Si_3$ See *Albite.*
AlO_4P See *Aluminum phosphate.*
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Al_2As_2 See *Aluminum arsenide.*
Al_2BaCl_8 Barium phosgeno-aluminate, 534^{9}.
Al_2BaO_4 Barium aluminate, 1021^{5}, 1765^{8}.
$Al_2Ba_2O_5$ + $5H_2O$, 1765^{8}.
Al_2BeO_4 See *Chrysoberyl.*
$Al_2Be_3O_{18}Si_6$ See *Beryl.*
Al_2CaCl_2 Calcium phosgeno-aluminate, 534^{9}.
$Al_2CaH_4O_{14}Si_4$ + $2H_2O$ See *Laumontite.*
$Al_2CaH_4O_{18}Si_6$ + $3H_2O$ See *Heulandite.*
$Al_2CaO_{16}Si_6$ + $5H_2O$ See *Stilbite.*
$Al_2Ca_2HKO_{30}Si_{12}$ See *Milarite.*
$Al_2Ca_2H_2O_{12}Si_3$ See *Prehnite.*
$Al_2Ca_8O_{15}Si_2$ See *Alite.*
Al_2Cl_8Sr Strontium phosgeno-aluminate, 534^{9}.
$Al_2Cr_4O_{15}$ Aluminum dichromate, 718^{1}.
Al_2Cu, 1735^{8}, 2640^{4}, 2652^{6}, 2653^{9}, 3424^{9}, 3425^{7}.
Al_2F_6 + $18H_2O$ See *Aluminum fluoride.*
$Al_2F_{10}H_{16}N_4$ Aluminum ammonium fluoride, 559^{7}.
$Al_2F_{10}K_4$ Aluminum potassium fluoride, 559^{7}.
$Al_2F_{10}Na_4$ Aluminum sodium fluoride, 559^{7}.
$Al_2F_{10}Rb_4$ Aluminum rubidium fluoride, 559^{7}.
$Al_2FeO_{16}S_4$ + $24H_2O$ (See also *Halotrichite.*) Aluminum iron sulfate, 719^{2}.
$Al_2Fe_3O_{12}$ See *Aluminum ferrate.*
$Al_2H_4Na_2O_{12}Si_3$ See *Natrolite.*
$Al_2H_4O_9Si_2$ See *Kaolin.*
$Al_2K_2O_{16}S_4$ + $24H_2O$ See *Alums.*
$Al_2MgO_{16}S_4$ + $22H_2O$ See *Pickeringite.*
Al_2Mg_3, 2813^{1}.
Al_2O_3 See *Alumina; Bauxite; Corundum; Hydrargillite.*
Al_2O_5Si See *Andalusite; Cyanite; Disthene; Sillimanite.*
$Al_2O_7Si_2$ (See also *Glagerite; Halloysite.*) 1746^{7}.
$Al_2O_9Si_3$ + $5H_2O$ See *Leverrierite.*
$Al_2O_{12}S_3$ See *Aluminum sulfate.*
$Al_2O_{12}U_3$ Aluminum uranate, 3657^{3}.
Al_2S_3 See *Aluminum sulfide.*
Al_2Se_3 See *Aluminum selenide.*
Al_2Te_3 See *Aluminum telluride.*
$Al_3Ca_2HO_{13}Si_3$ See *Clinozoisite; Epidote.*
$Al_3Ca_6HO_{21}Si_5$ + H_2O See *Vesuvianite.*

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$Al_3H_2KO_{12}Si_3$ See *Muscovite; Sericite.*
$Al_3H_6KO_{14}S_2$ See *Alunite.*
Al_3Ni, 3425[8].
Al_3Ti, 721[4].
$Al_4Cs_4O_{26}Si_9$ + H_2O See *Pollucite.*
Al_4Mg_3, 1974[3].
$Al_6Ca_7FH_{15}Mg_3O_{42}Si_7$ See *Kossmatite.*
$Al_6K_2O_{22}S_4$ + $6H_2O$ See *Alunite.*
$Al_6O_{13}Si_2$ See *Mullite.*
$Al_{10}Cl_{12}H_{12}O_{24}S_3$ + $30H_2O$ See *Trudellite.*
$Al_{12}CO_3$, 2813[7].
$AsBaHO_4$ + H_2O Barium arsenate, 1164[3].
$AsBr_3$ See *Arsenic bromide.*
$AsCl_3$ See *Arsenic chloride.*
$AsCoS$ See *Cobaltite.*
$AsCu_3S_4$ See *Enargite.*
AsF_3 See *Arsenic fluoride.*
$AsFeO_3$ See *Iron arsenites.*
$AsFeO_4$ + $2H_2O$ See *Scorodite.*
$AsFe_2$ See *Iron arsenides.*
AsH_3O_3 See *Arsenious acid.*
AsI_3 See *Arsenic iodide.*
$AsKO_2$ See *Potassium metaarsenite.*
$AsMn_2$ See *Manganese arsenides.*
$AsNaO_2$ See *Sodium arsenites.*
$AsNa_3O_3$ See *Sodium arsenites.*
$AsSn$, 1344[6].
$As_2BaH_4O_8$ + $2H_2O$ Barium arsenate, 1164[3].
$As_2Ba_3O_8$ Barium arsenate, 1164[3].
$As_2Ca_3O_8$ See *Calcium arsenate.*
$As_2CuO_{12}U_2$, 1344[8].
$As_2Cu_3O_6$ See *Copper arsenite.*
$As_2Cu_6S_7$ See *Tennantite.*
$As_2Fe_2O_6$ See *Iron arsenites.*
As_2H_2 Arsenic hydride, 880[2].
$As_2Mg_2O_7$ Magnesium pyroarsenate, 3660[7].
As_2Mg_3 See *Magnesium arsenide.*
As_2Mn_3 See *Manganese arsenide.*
$As_2Mn_3O_8$ See *Manganese arsenate.*
As_2O_3 See *Arsenic oxides.*
As_2O_5 See *Arsenic oxides.*
As_2Pt See *Sperrylite.*
As_2S_2 See *Realgar.*
As_2S_3 See *Arsenic sulfides.*
As_2Sn_3, 1344[6].
As_2Te_3 Arsenic telluride, 882[1].
As_3S Arsenic sulfide, 1186[3].
As_3Sn_3, 1344[6].
As_4Fe_3 See *Iron arsenides.*
As_4H_2 Arsenic hydride, 880[2].
As_4S_4 Arsenic sulfide, 1186[3].
$As_6Cl_2Pb_{10}O_{24}$ See *Mimetite.*
$AuBrH_3N$, 140[3].
$AuBrH_6N_2$, 140[3].
$AuBrH_9N_3$, 140[3].
$AuBrH_{12}N_4$, 140[3].
$AuBrH_{18}N_6$, 140[3].
$AuClH_3N$, 140[3].
$AuClH_6N_2$, 140[3].
$AuClH_9N_3$, 140[3].
$AuClH_{36}N_{12}$, 140[3].
$AuCl_3$ See *Gold chloride.*
$AuCl_4Cs$ Cesium chloroaurate, 2110[6].
$AuCl_4H$ See *Chloroauric acid.*
$AuCl_4K$ Potassium chloroaurate, 2110[6].
AuH_3IN, 140[3].
AuH_6IN_2, 140[3].
AuH_9IN_3, 140[3].
$AuH_{18}IN_6$, 140[3].
$AuH_{24}IN_8$, 140[3].
$AuHg_6$, 1210[7].
$AuNa_3O_6S_4$ (See also *Sanocrysin.*) Sodium aurothiosulfate, 559[7].
Au_2O See *Gold oxide.*
Au_2Te_3 See *Gold telluride.*

BCl_3 See *Boron chlorides.*
BCo_2, 3429[8].
BF_3 See *Boron fluoride.*
BF_3H_2S, 1551[1].
$BF_3H_{14}S_7$, 1551[1].
BF_4Cs See *Avogadrite.*
BF_4H See *Fluoboric acid.*
BF_4K See *Potassium fluoborate.*
BF_4Na Sodium fluoborate, 1499[1].
BHO_2 Metaboric acid, 25[8].
BHO_3 Perboric acid, 3127[8].
BH_2LiO_4 + H_2O Lithium perborate, 882[2].
BH_3 See *Boron hydride.*
BH_3O_3 See *Boric acid.*
BH_4NO_4 + $0.5H_2O$ Ammonium perborate, 882[2].
$BNaO_3$ + $4H_2O$ See *Sodium perborate.*
BNi_2, 3429[8].
BO See *Boron oxides.*
B_2CdO_4 Cadium borate, 1963[4].
$B_2Ce_2O_6$, 3658[2].
B_2H_6 See *Boron hydrides.*
$B_2La_2O_6$, 3658[2].
$B_2Li_2O_4$ Lithium borate, 1963[4].
B_2MnO_4 Manganese borate, 1963[5].
$B_2Nd_2O_6$, 3658[2].
B_2O_3 See *Boron oxides.*
B_2O_4Pb Lead borate, 1963[4].
$B_2O_6Yt_2$, 3658[2].
$B_2O_{12}Yt_2$, 3658[1].
$B_2Pr_2O_6$, 3658[2].
$B_4Ce_2O_9$, 3658[1].
$B_4La_2O_9$, 3658[1].
$B_4Li_2O_7$ Lithium borate, 1963[4].
B_4MnO_7 Manganese borate, 1963[5].
$B_4Na_2O_7$ See *Borax.*
$B_4Nd_2O_9$, 3658[2].
B_4O_7Pb Lead borate, 1963[4].
$B_4O_9Yt_2$, 3658[2].
$B_4Pr_2O_9$, 3658[2].
B_5NaO_8 + $7H_2O$ Sodium pentaborate, 2232[2].
B_6Ca Calcium boride, 2625[7].
$B_6Cd_2O_{11}$ Cadmium borate, 1963[4].
$B_6Ce_2O_{12}$, 3658[1].
$B_6La_2O_{12}$, 3658[1].
$B_6Li_2O_{10}$ Lithium borate, 1963[4].
B_6MnO_{10} Manganese borate, 1963[5].
$B_6Nd_2O_{12}$, 3658[1].
$B_6O_{10}Pb$ Lead borate, 1963[4].
$B_6Pr_2O_{12}$, 3658[1].
$B_8Li_2O_{13}$ Lithium borate, 1963[4].
$B_{10}Li_2O_{16}$ Lithium borate, 1963[4].
$B_{10}O_{17}Pb_2$ Lead borate, 1963[4].
$B_{16}Cl_2Mg_7O_{30}$ See *Boracite; Stassfurtite.*
$BaBeF_4$, 881[2].
$BaBe_2F_6$, 881[2].
$BaBr_2$ See *Barium bromide.*
$BaCl_2$ See *Barium chloride.*
$BaCl_6Pt$ Barium chloroplatinate, 694[8], 695[1].
BaF_2 See *Barium fluoride.*
$BaFeO_4$ See *Barium ferrate.*
$BaFe_2O_4$ Barium ferrite, 1939[9].
$BaH_2O_6S_2$, 1190[4].
BaI_2 See *Barium iodide.*
$BaMoO_4$ Barium molybdate, 1157[8].
BaN_2O_6 See *Barium nitrate.*
BaN_6 See *Barium azide.*
BaO See *Barium oxides.*
BaO_2 See *Barium oxides.*
BaO_4S See *Barite; Barium sulfate.*
BaO_4U Barium uranate, 3657[3].
BaO_6S_2 See *Barium dithionate.*
BaO_7V_2 See *Barium vanadate.*

BaS See *Barium sulfide.*
$BeBr_2H_{12}N_4$, 139^{7}.
$BeBr_2H_{18}N_6$, 139^{7}.
$BeBr_2H_{30}N_{10}$, 139^{7}.
$BeCl_2$ See *Beryllium chloride.*
$BeCl_2H_6N_2$, 139^{7}.
$BeCl_2H_{12}N_4$, 139^{7}.
$BeCl_2H_{18}N_6$, 139^{7}.
$BeCl_2H_{36}N_{12}$, 139^{7}.
BeF_3Na, 881^{1}.
BeH_2O_2 See *Beryllium hydroxide.*
$BeH_6N_2O_4S$, 2626^{4}.
$BeH_{12}I_2N_4$, 139^{7}.
$BeH_{18}I_2N_6$, 139^{7}.
$BeH_{30}I_2N_{10}$, 139^{7}.
$BeK_2O_8S_2$ Beryllium potassium sulfate, 347^{2}.
BeO See *Beryllium oxide; Bromellite.*
BeO_4S See *Beryllium sulfate.*
BeO_4Se See *Beryllium selenate.*
BeO_4U Beryllium uranate, 3657^{3}.
BeS Beryllium sulfide, 1925^{9}.
$Be_2FeO_{10}Si_2Yt_2$ See *Gadolinite.*
$Be_2O_{17}V_6$ Beryllium vanadate, 1185^{5}.
$BiCl_3$ See *Bismuth chlorides.*
$BiHO_2$ See *Bismuth hydroxides.*
BiH_2NO_5, 1572^{1}.
BiH_3 See *Bismuth hydrides.*
$BiH_{12}N_9O_{18}$, 1571^{8}.
$BiNO_4$ Bismuth subnitrate, 969^{8}.
BiN_3O_9 See *Bismuth nitrate.*
$Bi_2C_3O_9$ See *Bismuth carbonate.*
Bi_2HNO_6, 1572^{4}.
Bi_2H_2 See *Bismuth hydrides.*
$Bi_2H_2N_2O_9$, 1572^{1}.
$Bi_2Mg_3N_{12}O_{36}$ + $24H_2O$ Bismuth magnesium nitrate, 1936^{9}.
Bi_2O_3 See *Bismuth oxides.*
$Bi_2O_{12}S_3$ See *Bismuth sulfate.*
$Bi_2Pb_2S_5$ See *Cosalite.*
Bi_2Rh, 718^{4}.
Bi_2S_3 See *Bismuthinite; Bismuth sulfide.*
Bi_2Te_3 Bismuth telluride, 882^{1}, 1209^{4}.
$Bi_4N_2O_{11}$ + H_2O Bismuth nitrate, 560^{1}.
Bi_4PbS_4 See *Cannizarite.*
$Bi_4H_9N_5O_{26}$, 1572^{2}.
$Bi_{10}N_2O_{20}$ Bismuth nitrate, 560^{1}.
$BrClSn$ Stannous chlorobromide, 1039^{8}.
BrH See *Hydrobromic acid.*
$BrHMgS$ Magnesium bromide hydrosulfide, 879^{7}.
$BrHO_3$ See *Bromic acid.*
BrH_3HgN, 140^{2}.
BrH_3Si, 2962^{2}.
BrI See *Iodine bromide.*
$BrISn$ Stannous bromoiodide, 1039^{8}.
BrI_2K See *Potassium diiodobromide.*
$BrIr$, 3657^{5}.
BrK See *Potassium bromide.*
$BrKO_3$ See *Potassium bromate.*
$BrLi$ See *Lithium bromide.*
$BrMoO$ + $4H_2O$ See *Molybdenum oxybromide.*
$BrNa$ See *Sodium bromide.*
$BrNaO$ See *Sodium hypobromite.*
$BrRb$ See *Rubidium bromide.*
Br_2Ca See *Calcium bromide.*
Br_2Cd See *Cadmium bromide.*
Br_2CdH_3N, 139^{9}.
$Br_2CdH_6N_2$, 139^{9}.
$Br_2CdH_{18}N_6$, 139^{9}.
$Br_2CdH_{36}N_{12}$, 139^{9}.
Br_2ClK See *Potassium dibromochloride.*
$Br_2Cl_2Hg_2$ Mercury bromochloride, 3121^{2}.
$Br_2CrH_{15}N_5O$ + $1.5H_2O$, 716^{9}.
Br_2Cu See *Copper bromide.*
$Br_2CuH_6N_2$, 140^{5}.
$Br_2CuH_{12}N_4$, 140^{5}.
$Br_2CuH_{18}N_6$, 140^{5}.
$Br_2CuH_{30}N_{10}$, 140^{5}.
$Br_2Cu_4H_6O_6$ Basic copper bromide, 1184^{4}.
Br_2H_2Si, 2962^{2}.
$Br_2H_4IrO_2$, 3657^{5}.
$Br_2H_6HgN_2$, 140^{1}.
$Br_2H_{24}HgN_8$, 140^{1}.
$Br_2H_{30}MnN_{10}$, 139^{5}.
Br_2Hg See *Mercury bromides.*
Br_2Hg_2 See *Mercury bromides.*
Br_2Ir, 3657^{5}.
Br_2Mg See *Magnesium bromide.*
Br_2Ni See *Nickel bromide.*
Br_2O_6Pb + H_2O Lead bromate, 179^{1}.
Br_2Pb See *Lead bromide.*
Br_2Pt See *Platinum bromides.*
Br_2Ra See *Radium bromide.*
Br_2Sr See *Strontium bromide.*
Br_2Zn See *Zinc bromide.*
Br_3Fe See *Iron bromide.*
Br_3H_2IrO, 3657^{5}.
$Br_3H_4O_2Pt$, 718^{3}.
Br_3Ir, 3657^{5}.
Br_3K See *Potassium bromides.*
Br_3KPb + $^1/_2$ H_2O Lead potassium bromide, 3402^{5}.
Br_3Pt See *Platinum bromides.*
Br_3Rb See *Rubidium bromides.*
Br_3Sb See *Antimony bromide*
Br_4CdK_2 Cadmium potassium bromide, 3119^{5}.
Br_4Ge See *Germanium bromide.*
Br_4Pt See *Platinum bromides.*
Br_4Sn See *Tin bromide.*
Br_5KPb_2 Lead potassium bromide, 3402^{5}.
Br_5K_2Mo Molybdenum potassium bromide, 2796^{6}.
$Br_6Cu_3H_{30}N_{10}$, 140^{5}.
Br_6K_3Mo Molybdenum potassium bromide, 2796^{6}.
$Br_8Fe_3H_{12}O_6$, 2127^{8}.

$CAgN$ See *Silver cyanide.*
$CAgNS$ See *Silver thiocyanate.*
CAg_2O_3 See *Silver carbonate.*
$CAuClO$, 157^{8}.
$CBaO_3$ See *Barium carbonate.*
$CBaS_3$ See *Barium thiocarbonate.*
$CBeO_3$ See *Beryllium carbonate.*
$CBrN$ See *Cyanogen bromide.*
$CBrN_3O_6$ Nitroform, bromo-, 2979^{3}.
CBr_3NO_2 Bromopicrin, 363^{2}.
CBr_4Hg, 2295^{6}.
CBr_4Hg_2, 2295^{6}.
$CCaN_2$ See *Calcium cyanamide.*
$CCaO_3$ See *Calcite; Aragonite; Calcium carbonate; Vaterite.*
$CCdO_3$ See *Cadmium carbonate.*
$CClN$ See *Cyanogen chloride.*
CCl_2O See *Phosgene.*
CCl_2OPd Addn. compd. of $PdCl_2$ and CO, 2467^{2}.
CCl_2S See *Thiophosgene.*
CCl_3NO_2 See *Chloropicrin.*
CCl_4 See *Carbon tetrachloride.*
$CCoO_3$ See *Cobalt carbonate.*
$CCuO_3$ See *Copper carbonate.*
$CCuS_3$ See *Copper thiocarbonate.*
CF_4 See *Carbon tetrafluoride.*
$CFeO_3$ See *Iron carbonates; Siderite.*
CFe_3 See *Cementite; Iron carbide.*
$CHBr_3$ See *Bromoform.*
$CHCl_3$ See *Chloroform.*
CHI_3 See *Iodoform.*

$CHKO_2$ See *Potassium formate.*
CHN See *Hydrocyanic acid; Isohydrocyanic acid.*
$CHNO$ See *Cyanic acid; Fulminic acid; Isocyanic acid.*
$(CHNO)x$ Compd., decomps. 255°, from uric acid, 2826[3].
$CHNS$ See *Thiocyanic acid.*
$CHNSe$ Selenocyanic acid, 1364[3].
CHN_3S_2 Formic acid, dithiotriazo-, 28[7].
$CHNaO_2$ See *Sodium formate.*
$CHNaO_3$ See *Sodium carbonates.*
CH_2BrClO_3S Methanesulfonic acid, bromochloro-, *and NH_4 salt*, 3686[7].
CH_2Br_2 See *Methane, dibromo-.*
CH_2ClIO_3S Methanesulfonic acid, chloroiodo-, 3686[7].
CH_2Cl_2 See *Methane, dichloro-.*
$CH_2Cu_2O_5$, 1767[6].
CH_2I_2 Methane, diiodo-, 39[5], 537[4].
CH_2NNaO_2 Methane, nitro-, Na deriv., 3155[8].
CH_2N_2 (See also *Cyanamide.*) Methane, diazo-, 743[7], 1390[3].
CH_2O See *Formaldehyde.*
CH_2O_2 See *Formic acid.*
CH_2O_3 See *Carbonic acid.*
CH_3BrO Methyl hypobromite, 2997[1].
CH_3BrO_3S Methanesulfonic acid, bromo-, *Ba salt*, 900[4].
CH_3Br_2Sb Stibine, dibromomethyl-, 2977[4].
CH_3Cl See *Methane, chloro-.*
CH_3ClO Methyl hypochlorite, 2997[1]
CH_3Cl_2Sb Stibine, dichloromethyl-, 2977[4].
CH_3I See *Methane, iodo-*,
CH_3IMg Methylmagnesium iodide, 3693[8].
CH_3I_2Sb Stibine, diiodomethyl-, 2977[4].
CH_3NO See *Formamide.*
CH_3NO_2 See *Methane, nitro-.*
CH_3NO_3 Methyl nitrate, 3043[7].
$CH_3N_3O_3$ Urea, nitro-, 169[3].
CH_3NaO See *Sodium methoxide.*
CH_3NaO_3S See *Sodium formaldehydesulfoxylate.*
$CH_3NaO_4S_2$ *S*-Hydroxymethyl *O*-sodium thiosulfate, 3157[2].
CH_3SSb Stibine sulfide, methyl-, 2977[4].
CH_4 See *Methane.*
CH_4AsO_3 Methanearsonic acid, *Na salt*, 1887[6].
CH_4Cl_2Si, 2962[2].
CH_4N_2 See *Ammonium cyanide.*
CH_4N_2O See *Urea.*
CH_4N_2S See *Ammonium thiocyanate; Urea, thio-.*
$CH_4N_2SO_5$ Methanesulfonic acid, nitrosohydroxamino-, *K salt*, 3150[8].
CH_4O See *Methanol.*
CH_4O_4S Methanesulfonic acid, hydroxy-, 1301[6]. Methyl hydrogen sulfate, 694[5].
CH_4S Methyl mercaptan, 1095[8].
CH_5ClSi, 2962[2].
$CH_5Co_{12}Mo_{12}N_3O_{48}$ + $22H_2O$, 1185[4]
$CH_5Mn_{12}Mo_{12}N_3O_{48}$ + $18H_2O$, 1815[5].
CH_5N See *Methylamine.*
CH_5NO_2 See *Ammonium formate.*
CH_5NO_3 See *Ammonium carbonates.*
CH_5NO_4S Methanesulfonic acid, hydroxamino-, *K salt*, 3156[8].
$CH_5NO_6S_2$ Methanesulfonic acid, sulfamino-, *di-K salt*, 3157[2].
CH_5N_3 See *Guanidine.*
CH_5N_3O See *Semicarbazide.*
$CH_6AlF_4N_3$ + $1.5H_2O$, 719[6].
CH_6Cl_4FeN, 25[4].
CH_6N_2 Hydrazine, methyl-, 3000[1].
$CH_6N_2O_2$ See *Ammonium carbamate.*
$CH_6N_2O_3$ Hyperol, 158[6].
CH_6N_4S Carbohydrazide, thio-, 1810[7].
CH_6Si, 2962[2].
$CH_8CrN_3O_6P_2$ + $8H_2O$ Guanidine chromiphosphite, 2793[6].
$CH_8N_2O_3$ See *Ammonium carbonates.*
$CH_{15}BrCoN_5O_3$, 878[2].
$CH_{15}CoIN_5O_3$, 878[2].
$CH_{15}CoN_6O_6$, 878[2].
$CHgO_3$ See *Mercury carbonate.*
CI_2KNSe, 346[1].
CKN See *Potassium cyanide.*
$CKNO$ See *Potassium cyanate.*
CK_2O_3 See *Potassium carbonates.*
CLi_2O_3 See *Lithium carbonate.*
$CMgN_2$ See *Magnesium cyanamide.*
$CMgO_3$ See *Magnesite; Magnesium carbonate*
$CMnO_3$ See *Rhodochrosite.*
$CNNa$ See *Sodium cyanide.*
$CNNaS$ See *Sodium thiocyanate.*
CN_6O Carbonyl azide, 2500[1].
CNa_2O_3 See *Sodium carbonates.*
$CNa_6O_{11}S_2$ Sodium carbonate-sulfate, 2601[6].
CNi_3 Nickel carbide, 570[9].
CO See *Carbon monoxide.*
CO_2 See *Carbon dioxide.*
CO_3Pb See *Lead carbonate.*
CO_3Sr See *Strontium carbonate.*
CO_3Tl_2 See *Thallium carbonate.*
CO_3Zn See *Smithsonite; Zinc carbonate.*
$CPbS_3$ See *Lead thiocarbonate.*
CS_2 See *Carbon disulfide.*
CSi See *Carborundum; Silicon carbide.*
CZr See *Zirconium carbide.*
C_2Ag_2 See *Silver acetylide.*
$C_2Ag_2O_4$ Silver oxalate, 3571[1].
C_2BeO_4 See *Beryllium oxalate.*
C_2Ca See *Calcium carbide.*
C_2CaN_2 See *Calcium cyanide.*
$C_2CaNa_2O_6$ + $5H_2O$ Calcium sodium carbonate, 685[5].
C_2CaO_4 See *Calcium oxalate; Whewellite.*
C_2Cl_4 See *Ethylene, tetrachloro-.*
C_2Cl_6 See *Ethane, hexachloro-.*
$C_2CoN_2S_2$ See Cobalt thiocyanate.
C_2CoO_4 See *Cobalt oxalate.*
C_2Cr_3 See *Chromium carbide.*
C_2CuKN_2 See *Potassium cuprocyanide.*
$C_2CuK_2O_6$, 1767[5].
$C_2CuNa_2O_6$, 1767[5].
$C_2HBrClFO_2$ Acetic acid, bromochlorofluoro-, 3686[7].
C_2HCl_3 See *Ethylene, trichloro-.*
C_2HCl_3O See *Chloral.*
$C_2HCl_3O_2$ See *Acetic acid, trichloro-.*
C_2HCl_5 See Ethane, pentachloro-.
C_2H_2 See *Acetylene.*
$C_2H_2AsCl_3$ See *Lewisite.*
C_2H_2BrCl See *Ethylene, bromochloro-.*
$C_2H_2BrClO_2$ Acetic acid, bromochloro-, 3444[9], 3686[6].
$C_2H_2BrFeO_4$ + H_2O, 1180[7].
$C_2H_2Br_2$ See *Ethylene, dibromo-.*
$C_2H_2Br_2N_2O_2$ Glyoxime, dibromo-, 2822[1].
$C_2H_2Br_4$ Ethane, *s*-tetrabromo-, 1086[4].
$C_2H_2CaO_6$ See *Calcium carbonates.*
$C_2H_2ClFeO_4$ + H_2O, 1180[7].
C_2H_2ClI See *Ethylene, chloroiodo-.*
C_2H_2ClN Acetonitrile, chloro-, 739[9].
$C_2H_2Cl_2$ See *Ethylene, dichloro-.*
$C_2H_2Cl_2N_2O_2$ Glyoxime, dichloro-, 2822[1].
$C_2H_2Cl_2O_2$ See *Acetic acid, dichloro-.*
$C_2H_2Cl_4$ See *Ethane, tetrachloro-.*
$C_2H_2I_2$ See *Ethylene, diiodo-.*
$C_2H_3K_2N_3O_2$ Biuret, potassium derivative, 717[2].
$C_2H_2N_2S_3$ See *Perthiocyanic acid.*

C_2H_2O Ketene, 42^8, 590^7, 2321^7, P 2333^1.
$C_2H_2O_2$ Glyoxal, 45^7, 3446^8.
$C_2H_2O_3$ See *Glyoxylic acid.*
$C_2H_2O_4$ See *Oxalic acid.*
$C_2H_2O_8Pb_3$ See *Hydrocerussite.*
$C_2H_3AgO_2$ See *Silver acetate.*
$C_2H_3AlO_4$ + H_2O, 1569^7.
$C_2H_3BeNa_3O_8$, 2128^1.
$C_2H_3BrO_5S$ Acetic acid, bromosulfo-, *and salts,* 900^{1,3}.
C_2H_3Cl Ethylene, chloro-, 2815^6.
C_2H_3ClO See *Acetyl chloride.*
$C_2H_3ClO_2$ See *Acetic acid, chloro-.*
$C_2H_3ClO_5S$ Acetic acid, chlorosulfo-, 3445^3; *K salt,* 319^8.
$C_2H_3Cl_3$ Ethane, 1,1,2-trichloro-, 1977^3.
$C_2H_3Cl_3O_2$ See *Chloral hydrate.*
$C_2H_3HgO_2$ See *Mercury acetates.*
$C_2H_3KO_2$ See *Potassium acetate.*
C_2H_3N (See also *Acetonitrile.*)
Methane, isocyano-, 1795^8.
C_2H_3NS Isothiocyanic acid, methyl ester, 374^4, 2853^2.
Thiocyanic acid, methyl ester, 374^4.
$C_2H_3NaO_2$ See *Sodium acetate.*
$C_2H_3NaO_3$ Glycolic acid, Na salt, 2456^1.
$C_2H_3O_2Tl$ Thallium acetate, 2206^9.
C_2H_4 See *Ethylene.*
$C_2H_4BeNa_2O_8$, 2128^1.
C_2H_4BrNO Acetamide, *N* bromo-, 2979^4.
$C_2H_4Br_2$. See *Ethane, dibromo-.*
$C_2H_4Cl_2$ See *Ethane, dichloro-.*
$C_2H_4Cl_2O$ Ether, bis(chloromethyl), 1588^1.
$C_2H_4KN_3O_2$ Biuret, mono-K deriv., 717^2.
$C_2H_4N_2O_2$ Oxamide, 2491^7.
$C_2H_4N_2O_6$ Ethylene nitrate, 3043^7.
$C_2H_4N_2S_2$ Oxamide, dithio-, 3690^2.
$C_2H_4N_4$ See *Guanidine, cyano-.*
C_2H_4O (See also *Acetaldehyde.*)
Ethylene oxide, 587^5, 1592^8, 2146^8.
Vinyl alcohol, 1550^7.
C_2H_4OS Acetic acid, thiol-, 1396^9.
$C_2H_4O_2$ See *Acetic acid; Formic acid, methyl ester.*
$C_2H_4O_3$ See *Glycolic acid*
$C_2H_4O_4$ See *Glyoxylic acid.*
$C_2H_5AlI_2$ Ethylaluminum diiodide, 361^6.
$C_2H_5AsO_5$ Acetic acid, arsono-, 40^6.
C_2H_5Br See *Ethane, bromo-.*
C_2H_5BrHg Ethylmercuric bromide, 362^2.
C_2H_5BrMg Ethylmagnesium bromide, 2999^3.
C_2H_5BrO Ethanol, 2-bromo-, 1592^5, 3283^1.
$C_2H_5Br_3Se$ Ethylselenonium tribromide, 1051^5.
C_2H_5Cl See *Ethane, chloro-.*
C_2H_5ClO Ethanol, 2-chloro-, 1551^4, 3687^7.
Ether, chloromethyl methyl, 1588^6, 2555^3.
Ethyl hypochlorite, 129^9.
$C_2H_5FeN_2O_3S$, 2455^4.
C_2H_5I See *Ethane, iodo-.*
C_2H_5Li Lithium ethyl, 3688^5.
C_2H_5NO (See also *Acetamide.*)
Acetaldehyde oxime, 329^1, 1978^3.
$C_2H_5NO_2$ See *Ethyl nitrite; Glycine.*
C_2H_5NaO See *Sodium ethoxide.*
C_2H_6 See *Ethane.*
$C_2H_6BeO_8$, 2128^1.
C_2H_6BrOSb Stibine oxybromide, dimethyl-, 2077^8.
C_2H_6BrSb Stibine, bromodimethyl-, 2977^3.
$C_2H_6Br_2CaO$, 1746^2.
$C_2H_6Br_3Sb$ Stibine, bromodimethyl-, dibromide, 2977^3.
C_2H_6ClOSb Stibine oxychloride, dimethyl-, 2977^2.
C_2H_6ClSb Stibine, chlorodimethyl-, 2977^2.
$C_2H_6Cl_3Sb$ Stibine, chlorodimethyl-, dichloride, 2977^2.
$C_2H_6Cl_4N_2Pt$, 1765^3.
C_2H_6IOSb Stibine oxyiodide, dimethyl-, 2977^3.
C_2H_6ISb Stibine, iododimethyl-, 2977^3.
$C_2H_6I_2N_4Pb$, 3657^2.
$C_2H_6N_2O$ Urea, methyl-, 901^2.
$C_2H_6N_2O_6S_2$ Methanesulfonic acid, azobis-, *di-K salt,* 3156^9.
$C_2H_6N_2O_7S_2$ Methanesulfonic acid, (nitrosoimino)bis-, *di-K salt,* 3156^7.
$C_2H_6N_4O$ See *Urea, guanyl-.*
$C_2H_6N_4O_8S_2$ Methanesulfonic acid, (dinitrosohydrazo)bis-, *di-K salt,* 3156^9.
$C_2H_6N_4S_2$ Biurea, dithio-, 2161^7.
Formamidine, dithiobis-, 2161^5.
C_2H_6O (See also *Ethyl alcohol.*)
Methyl ether, 359^6, P 3298^2.
$C_2H_6O_2$ (See also *Glycol.*)
Ethyl hydrogen peroxide, 798^8.
$C_2H_6O_2S$ Ethanesulfinic acid, 694^6.
$C_2H_6O_2Se$ Ethaneseleninic acid, 694^6; *HNO_3 compd.,* 1051^5.
$C_2H_6O_3Sn$ Ethanestannonic acid, 2-hydroxy-, *Na salt,* P 1415^8.
$C_2H_6O_4S$ (See also *Ethylsulfuric acid.*)
Methyl sulfate, 1784^2, 2323^7.
C_2H_6S Ethyl mercaptan, 2481^8, 2816^5, 2976^8, 3747^8.
C_2H_6Se Ethyl selenomercaptan, 1051^4.
$C_2H_7AsO_2$ See *Cacodylic acid.*
C_2H_7N (See also *Ethylamine.*)
Dimethylamine, 2608^6, 2820^6.
C_2H_7NO Aldehyde-ammonia, P 210^2.
$C_2H_7NO_2$ See *Ammonium acetate.*
$C_2H_7NO_3S$ See *Taurine.*
$C_2H_7NO_7S_2$ Methanesulfonic acid, isonitrosobis-, *K salt,* 3156^8.
$C_2H_7N_3$ See *Guanidine, methyl-.*
$C_2H_7N_3O_7S_2$ Methanesulfonic acid, (nitrosohydrazo)bis-, *di-K salt,* 3156^9.
$C_2H_7N_5$ Biguanide, 2965^3.
$C_2H_7O_2Sb$ Stibinic acid, dimethyl-, 2977^3.
$C_2H_8Cl_4FeN$, 25^4.
$C_2H_8N_2$ See *Ethylenediamine.*
$C_2H_8N_2O_4$ See *Ammonium oxalate.*
$C_2H_8N_2O_6S_2$ Methanesulfonic acid, hydrazobis-, *K salts,* 3156^8.
$C_2H_8N_2O_9S_3$ Methanesulfonic acid, (sulfohydrazo)bis-, *tri-K salt,* 3157^1.
C_2H_8Si, 2962^2.
$C_2H_{10}AlF_5N_2$ + H_2O, 719^6.
$C_2H_{10}Br_4Cu_2N_2$, 3401^3.
$C_2H_{10}Cl_4Cu_2N_2$, 3401^2.
$C_2H_{10}CoMo_2N_6O_7$ + $4H_2O$, 1185^3.
$C_2H_{10}Co_7Mo_7N_6O_{28}$ + $18H_2O$, 1185^3.
$C_2H_{10}NO_4P$ Colamine, phosphate, 3014^6.
$C_2H_{12}AlF_5N_6$, 719^6.
$C_2H_{12}Al_2N_6O_{16}S_4$ + $12H_2O$, 879^2.
$C_2H_{12}CdN_6O_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}ClCoN_4O_4$, 878^2.
$C_2H_{12}CoN_6O_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}Cr_2MgN_6O_8$ + $6H_2O$, 879^1.
$C_2H_{12}Cr_2N_6O_{16}S_4$ + $12H_2O$, 879^2.
$C_2H_{12}CuN_6O_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}F_3FeN_2O$, 719^6.
$C_2H_{12}FeN_6O_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}Fe_2N_6O_{16}S_4$ + $12H_2O$, 879^2.
$C_2H_{12}MgN_6O_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}MgN_6S_2$, 3373^7.
$C_2H_{12}MgN_6Se_2$, 3373^7.
$C_2H_{12}MnN_6O_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}N_6NiO_8S_2$ + $6H_2O$, 878^9.
$C_2H_{12}N_6O_8S_2Zn$ + $6H_2O$, 878^9.

$C_2H_{12}N_6O_{10}S_2U$, 878^9.
$C_2H_{12}N_6O_{16}S_4V_2$, 879^2.
$C_2H_{12}N_6Se_2Zn$, 3373^7.
$C_2H_{14}F_5FeN_6O$, 719^6.
$C_2H_{15}ClCoN_5O_4$, 878^3.
$C_2H_{16}Cl_2CuN_2O_{12}$, 3401^3.
$C_2H_{16}CrN_5O_5 + 2H_2O$, 716^9.
$C_2H_{18}CoN_6O_4$, 2924^3.
$C_2H_{18}CoN_8S_2$, 2924^2.
$C_2H_{18}MgN_8Se_2$, 3373^7.
$C_2H_{24}Co_2N_8O_{10}S$, 878^2.
$C_2H_{30}CoN_{12}S_2$, 2924^4.
C_2HgN_2 See *Mercury cyanides.*
$C_2HgN_2O_2$ See *Mercury fulminate.*
$C_2Hg_2N_2O$ Mercury oxycyanide, 1686^8.
$C_2IKN_2Se_2$, 346^1.
$C_2K_2O_4$ See *Potassium oxalate.*
C_2MgO_4 See *Magnesium oxalate.*
C_2N_2 See *Cyanogen.*
C_2Na_2 See *Sodium carbide.*
C_2N_2Ni See *Nickel cyanide.*
$C_2N_2S_2$ See *Thiocyanogen.*
$C_2N_2Se_2$ Selenocyanogen, 345^9, 1364^1.
$C_2N_2Se_3$, 1364^3.
$C_2N_6S_4$ Carbon disulfide, azido-, 3158^7.
$C_2Na_2O_4$ See *Sodium oxalate.*
C_2O_6U Uranyl oxalate, 684^8.
C_2O_8Pb Sec *Lead perchlorate.*
C_2U See *Uranium carbide.*
$C_3Cl_2O_4Rh_2$, 157^8.
$C_3CsN_3Se_3$, 346^3.
$C_3Cu_2N_3S_3$ Copper thiocyanate, 1964^3.
$C_3Fe_2S_9$ See *Iron thiocarbonates.*
$C_3H_2Br_2N_2O$ Acetamide, α,α-dibromo-α-cyano-, 365^4.
$C_3H_2Br_2O_3$ Pyruvic acid, dibromo-, 2821^9.
$C_3H_2Cl_2N_2O$ Acetamide, α,α-dichloro-α-cyano-, 365^5.
$C_3H_2Cl_2O_2$ Malonyl chloride, 1233^2.
$C_3H_2N_2O_3$ Parabanic acid, 2662^4.
$C_3H_2N_2O_4$ Glyoxylic acid, cyano-, *N*-oxide, oxime, *and salts*, $2822^{2,3}$.
$C_3H_2O_5$ See *Mesoxalic acid.*
C_3H_3Br Propine, 3-bromo-, 3012^5.
$C_3H_3BrCl_2O$ Propionaldehyde, α-bromo-α,β-dichloro-, 1054^4.
$C_3H_3BrCl_2O_2$ Propionic acid, α-bromo-α,β-dichloro-, 1054^4.
$C_3H_3BrN_2O_3S$ 4(or 5)-Imidazolesulfonic acid, 5(or 4)-bromo-, 415^5.
$C_3H_3Br_2ClO$ Propionaldehyde, α,β-dibromo-α-chloro-, 1054^4.
$C_3H_3Br_2ClO_2$ Propionic acid, α,β-dibromo-α-chloro-, 1054^4.
$C_3H_3Br_3O$ Propionaldehyde, α,α,β-tribromo-, 1054^4.
$C_3H_3Br_3O_2$ Propionic acid, α,α,β-tribromo-, 1054^4.
$C_3H_3ClN_4$ 4-Pyrazolediazonium chloride, 759^4.
$C_3H_3Cl_3O$ Propionaldehyde, α,α,β-trichloro-, 1054^4.
$C_3H_3Cl_3O_2$ Acetic acid, trichloro-, methyl ester, 2455^9.
Propionic acid, α,α,β-trichloro-, 1054^4.
C_3H_3IO Acrolein, α-iodo-, 1054^4.
$C_3H_3NOS_2$ Rhodanine, 1626^9.
$C_3H_3NO_2$ Formic acid, cyano-, Me ester, 47^3.
$C_3H_3N_3O_3$ See *Cyanuric acid.*
C_3H_4 Allene, 3685^4.
Cyclopropene, 2988^9.
Propine, 3685^2.
$C_3H_4Br_2$ Propene, dibromo-, 39^7, 899^3, 3155^4.
$C_3H_4ClNO_2$ Compd., m. 118–20°, from Me *N*-(β,β-dichloroethyl)carbamate and HCl, 41^1.
Pyruvyl chloride, oxime, 360^2.
$C_3H_4Cl_2$ Propene, 1,3-dichloro-, 2676^9.
$C_3H_4Cl_2O$ 2-Propanone, 1,3-dichloro-, 50^7.
$C_3H_4K_2N_4O_3$ Triuret, di-K deriv., 717^3.
$C_3H_4N_2$ Glycinonitrile, *N*-methylene-, 2980^9.
Hydroformamine cyanide, 44^1.
Imidazole, 3030^4, 3106^2.
$C_3H_4N_2O_2$ Hydantoin, 3691^2.
$C_3H_4N_2O_3S$ Imidazolesulfonic acid, 415^4, 3106^1.
C_3H_4O See *Acrolein.*
$C_3H_4O_2$ (See also *Pyruvaldehyde.*)
Acrylic acid, 2010^9.
$C_3H_4O_3$ (See also *Pyruvic acid.*)
Pyruvaldehyde, hydroxy-, 3692^8.
$C_3H_4O_4$ See *Malonic acid.*
$C_3H_4O_6$ See *Mesoxalic acid.*
C_3H_5Br Propene, bromo-, 39^4, 545^3.
$C_3H_5BrO_2$ Propionic acid, bromo-, 43^9, 861^5.
$C_3H_5Br_3$ Propane, 1,2,3-tribromo-, 39^4, 3685^4.
$C_3H_5Br_3O_2Te$ (α-Carboxyethyl)tellurium tribromide, 2670^2.
C_3H_5ClO Epichlorohydrin, 43^2.
Propionaldehyde, β-chloro-, 3692^9.
C_3H_5ClOS Formic acid, chlorothiol-, Et ester, 371^6.
—, chlorothiono-, Et ester, 371^6.
$C_3H_5ClO_2$ Formic acid, chloro-, Et ester, 371^5, 1605^3, 2926^5.
$C_3H_5ClS_2$ Formic acid, chlorodithio-, Et ester, 371^7.
$C_3H_5Cl_3O$ Isopral, 1279^5, 3512^2.
$C_3H_5Cl_3O_2Te$ (α-Carboxyethyl)tellurium trichloride, 2670^2.
$C_3H_5CuNO_2$ 2-Propanone, 1-hydroxy-, oxime, Cu deriv., 1055^6.
$C_3H_5IO_2$ Acetic acid, iodomethyl ester, 364^6.
Propionic acid, α-iodo-, 861^5; *and salts*, $2978^{2,4,5}$.
$C_3H_5KN_4O_3$ Triuret, potassium derivative, 717^3.
C_3H_5N Ethane, isocyano-, 3704^9.
Propionitrile, 1216^8, 3705^1.
C_3H_5NO Hydracrylonitrile, 43^1.
$C_3H_5NO_2$ Glycine, *N*-methylene-, *Na salt*, 3283^2.
$C_3H_5NO_3$ Pyruvic acid, oxime, 41^9.
Pyruvohydroxamic acid, 1978^4.
$C_3H_5NO_4$ Tartronamic acid, 1926^9.
C_3H_5NS Isothiocyanic acid, Et ester, 2835^2.
$C_3H_5N_3O_9$ See *Nitroglycerin.*
$C_3H_5N_5S_2$ 1,2,4-Thiodiazole, 3,5-diamino-, thiocyanate, 2161^8.
$C_3H_5NaO_2$ Formic acid, Et ester, Na deriv., 2825^1.
C_3H_6 See *Propene.*
$C_3H_6AsNaO_2$ Arsylene, 2019^1.
$C_3H_6Br_2$ See *Propane, dibromo-.*
$C_3H_6ClCrN_4NaS_3$, 2625^9.
$C_3H_6Cl_2O$ Propanol, dichloro-, 43^2, P 3171^8.
$C_3H_6Cl_2O_4S_2$ 1,3-Propanedisulfonyl chloride, 913^6.
$C_3H_6Hg_4I_{11}K_4O$, 2935^9.
C_3H_6INO Propionamide, α-iodo-, $2978^{2,5}$.
C_3H_6NOSb Stibine, cyanodimethyl-, oxide, 2482^1.
C_3H_6NSb Stibine, cyanodimethyl-, 361^7, 2482^1.
$C_3H_6N_2O_3$ Pyruvohydroxamic acid, oxime, 1978^4; *salts*, $747^{6,7}$.
$C_3H_6N_2O_7$ Methylal, nitronitroxy-, 1588^7.
$C_3H_6N_6O_6$ 1,2,3-Cyclopropanetriamine, N^1,N^2,N^3-trinitro-, 3597^1.
C_3H_6O (See also *Acetone; Allyl alcohol.*)
Propene oxide, 2820^9.

Δ^{1}-2-Propenol, 41[4,5].
$C_3H_6OS_2$ Xanthic acid, *K salt*, 1365[3], 2325[5].
$C_3H_6O_2$ See "*methyl ester*" under *Acetic acid;* "ethyl ester" under *Formic acid; Propionic acid.*
$C_3H_6O_3$ (See also *Glyceraldehyde; Lactic acid; 2-Propanone, dihydroxy-.*)
Hydracrylic acid, 2010[9].
Trioxymethylene, 3129[3].
$C_3H_6O_5S$ Methanesulfonic acid, acetate, *K salt*, 3157[3].
C_3H_6S Allyl mercaptan, 2991[3].
$C_3H_7BiN_3O_{13}$, 1571[8].
C_3H_7Br See *Propane, bromo-.*
C_3H_7BrHg Propylmercuric bromide, 362[3].
C_3H_7BrO 2-Propanol, 1-bromo-, 2659[7].
$C_3H_7Br_2CdS_2$, 326[6].
$C_3H_7Br_2HgS_2$, 326[6].
$C_3H_7Br_2S_2Zn$, 326[6].
$C_3H_7Br_4S_2Sn$, 326[6].
$C_3H_7CdCl_2S_2$, 326[5].
$C_3H_7CdI_2S_2$, 326[6].
C_3H_7Cl See *Propane, chloro-.*
C_3H_7ClO Propanol, chloro-, 1385[9], 3687[7].
$C_3H_7ClO_2$ α-Chlorohydrin, 43[1], 2311[7].
$C_3H_7Cl_2CrS_2$, 326[6].
$C_3H_7Cl_2HgS_2$, 326[6].
$C_3H_7Cl_2S_2Zn$, 326[5].
$C_3H_7Cl_4S_2Sn$, 326[6].
$C_3H_7CuIS_2$, 326[5].
C_3H_7HgI Propylmercuric iodide, 362[3].
$C_3H_7HgI_3S_2$, 326[6].
C_3H_7I Propane, iodo-, 3383[9].
$C_3H_7I_2S_2Sn$, 326[6].
$C_3H_7I_2S_2Zn$, 326[5].
$C_3H_7KO_3$ Glycerol, potassium derivative, 3688[3].
C_3H_7NO Acetone, oxime, 40[9]; *$ZnCl_2$ deriv.*, 1784[9].
Propionamide, 1054[9].
$C_3H_7NO_2$ (See also *Alanine;* "ethyl ester" under *Carbamic acid.*)
Sarcosine, 3691[3].
$C_3H_7NO_2S$ See *Cysteine.*
$C_3H_7NO_3$ See *Serine.*
$C_3H_7NO_4S$ Ethanesulfonic acid, 1-carbamyl-, *NH_4 salt*, 1594[9].
$C_3H_7NS_2$ Carbamic acid, dimethyldithio-, *Pb salt*, 313[9].
$C_3H_7NaO_3$ Glycerol, sodium deriv., 3688[3].
$C_3H_7O_4P$ Allyl alcohol, phosphate, *Ba salt*, 1588[9].
$C_3H_7O_6P$ Phosphoric acid, glycerol diester, 2980[1].
Propionic acid, β-phosphono-, *and salts*, 2978[9], 2979[1].
$C_3H_7S_2$ Ethane, 1,2-bis(methylmercapto)-, 326[4].
C_3H_8 See *Propane.*
$C_3H_8BiN_3O_{13}$, 1571[8].
$C_3H_8BrO_4P$ 1-Propanol, 3-bromo-, 1-phosphate, *Ba salt*, 1588[9].
$C_3H_8IO_5P$ 1,2-Propanediol, 3-iodo-, 1-phosphate, *Ba salt*, 1588[9].
$C_3H_8N_2O_2$ Propionic acid, α,β-diamino-, *and -HCl*, 2982[8].
$C_3H_8N_2S$ Urea, *s*-dimethylthio-, 2835[3].
C_3H_8O See *Isopropyl alcohol; Propyl alcohol.*
C_3H_8OS 1-Propanol, γ-mercapto-, 737[8].
$C_3H_8O_2$ Methylal, 423[4].
Propanediol, 740[1], 1787[8], 2257[1], 2659[7], 3356[7].
$C_3H_8O_3$ See *Glycerol.*
C_3H_8S Isopropyl selenomercaptan, 3273[8].
$C_3H_9AsO_2$ Arsinic acid, ethylmethyl-, *and salts*, 1977[8,9].
C_3H_9B Borine, trimethyl-, 2635[7].
$C_3H_9BO_3$ Methyl borate, 1605[1].
$C_3H_9Cl_2Sb$ Stibine, trimethyl-, dichloride, 2482[1].
C_3H_9N Trimethylamine, 374[4], 2608[9]; *and -HCl*, 40[8].
C_3H_9NO 1-Propanol, 3-amino-, 2658[2].
Trimethylamine oxide, 535[8], 2025[4].
$C_3H_9N_3$ Guanidine, dimethyl-, 1113[8], 3158[9].
—, α-ethyl-, *and salts*, 3284[6,7].
$C_3H_9O_6P$ Glycerophosphoric acid, *and salts*, 1218[6], 1219[4,5].
$C_3H_{10}BrOSb$ Stibine, trimethyl-, hydroxybromide, 2482[1].
$C_3H_{10}ClOSb$ Stibine, trimethyl-, hydroxychloride, 2482[1].
$C_3H_{10}Cl_4FeN$, 25[5].
$C_3H_{10}N_2$ 1,3-Propanediamine, 2658[2].
$C_3H_{10}N_2O_2$ 1,2-Propanediol, 3-hydrazino-, *-HCl*, 2816[1].
$C_3H_{10}N_2O_4S_2$ 1,3-Propanedisulfonamide, 913[8].
$C_3H_{10}OSn$ Stannane, hydroxytrimethyl-, 3747[5].
$C_3H_{12}Br_2CaO_3$, 1746[2].
$C_3H_{12}CaCl_2O_3$, 1746[2].
$C_3H_{18}AlN_6S_3$, 3373[7].
$C_3H_{18}AlN_6Se_3$, 3373[7].
$C_3H_{18}AlF_6N_9$, 719[6].
$C_3H_{18}CoN_6S_3$, 2924[2].
$C_3H_{18}CrF_6N_9$, 719[7].
$C_3KN_3Se_3$, 346[1].
C_3O_2 See *Carbon suboxide.*
C_4BaN_4Pt + $4H_2O$ Barium cyanoplatinite, 3644[2].
$C_4CdK_2N_4$ Cadmium potassium cyanide, 2798[3].
$C_4CuK_6O_{12}$, 1767[8].
C_4FeO_4 Iron carbonyl, P 3543[3].
C_4H_2 Biacetylene, 1051[3].
$C_4H_2Br_2N_2O_3$ Barbituric acid, dibromo-, 1113[2].
$C_4H_2CaN_4$, 971[3].
$C_4H_2Cl_4O_6U$ + $2H_2O$ Uranium dichloroacetate (basic), 3139[7].
$C_4H_2Cl_4O_6U$ Uranyl dichloroacetate, 3139[7].
$C_4H_2I_2O_4$ Fumaric acid, diiodo-, 1980[3].
$C_4H_3AsINO_5S$ 2-Thiophenearsonic acid, 5-iodo-3(or 4)-nitro-, 1407[1].
$C_4H_3BrN_2O_3$ Barbituric acid, 5-bromo-, *N_2H_4 salt*, 2825[9].
$C_4H_3ClN_2O_3$ Barbituric acid, 5-chloro-, *N_2H_4 salt*, 2825[9].
$C_4H_3ClO_4$ Fumaric acid, chloro-, *mono-NH_4 salt*, 11[7].
Maleic acid, chloro-, *mono-K salt*, 11[7].
$C_4H_3NO_2S$ Thiophene, 3-nitro-, 2854[8].
$C_4H_3N_3O_4$ Violuric acid, 708[7].
$C_4H_3Na_3O_{12}$ Sodium carbonate (acid), 2051[3].
$C_4H_4AsBrO_3S$ 2-Thiophenearsonic acid, 5-bromo-, 1406[9].
$C_4H_4AsIO_3S$ 2-Thiophenearsonic acid, 5-iodo-, 1406[9].
$C_4H_4BiClO_6$ + $3H_2O$, 3403[8].
$C_4H_4BiClO_7$ + $4H_2O$, 3403[8].
$C_4H_4BiNO_9$ + 5 or $8H_2O$, 3403[9].
C_4H_4BrMgN Pyrrylmagnesium bromide, 1406[5].
$C_4H_4Br_2N_2$ Imidazole, 4,5-dibromo-1-methyl-, *-HCl*, 415[4].
$C_4H_4Br_2O_4$ Succinic acid, α,β-dibromo-, 1980[3].
$C_4H_4Cl_2O_5U$ + $2.5H_2O$ Uranium chloroacetate (basic), 3139[7].
$C_4H_4Cl_2O_6U$ Uranyl chloroacetate, 3139[7].
$C_4H_4KN_3O_3$ + $0.5H_2O$ 5-Imidazolol, 1-methyl-4-nitro-, K deriv., 1805[4].
$C_4H_4KN_3O_4$ Hydroxonic acid, K-deriv., *K-salt*, 1386[9].
$C_4H_4KO_7Sb$ + $0.5H_2O$ See *Tartar emetic.*
$C_4H_4N_2$ Succinonitrile, 2995[9].
$C_4H_4N_2O_2$ Uracil, 1257[3], 3169[3], 3303[6].

$C_4H_4N_2O_3$ (See also *Barbituric acid.*)
Isobarbituric acid, 368[4].
$C_4H_4N_2O_5$ Alloxanic acid, *salts*, 3691[7,8,9].
$C_4H_4N_2S_2$ Ethane, *s*-dithiocyano-, 1603[9].
$C_4H_4N_3NaO_3$ 5-Imidazolol, 1-methyl-4-nitro-, Na deriv., 1805[4].
$C_4H_4NaO_7Sb$ See *Sodium antimonyl tartrate.*
C_4H_4O Furan, 242[7], 736[6].
$C_4H_4O_3$ Succinic anhydride, 1551[9], 3621[6].
$C_4H_4O_4$ See *Fumaric acid; Maleic acid.*
$C_4H_4O_5$ See *Oxalacetic acid.*
$C_4H_4O_6Tl_2$ Tartaric acid, di-Tl deriv., *di-Tl salt*, 49[7].
C_4H_4S See *Thiophene.*
$C_4H_5BrN_2O_3S$ Imidazolesulfonic acid, bromomethyl-, 415[5].
C_4H_5BrO Crotonaldehyde, α-bromo-, 3006[6].
C_4H_5ClO 3-Butin-2-ol, 1-chloro-, 3444[2].
$C_4H_5ClO_2$ Crotonic acid, β-chloro-, 708[9].
Isocrotonic acid, β-chloro-, 708[9].
$C_4H_5ClO_4$ Succinic acid, chloro-, 3286[1].
$C_4H_5Cl_3O_2$ Acetic acid, trichloro-, ethyl ester, 1751[7], 2455[9]
Butyric acid, trichloro-, 536[1].
$C_4H_5KO_6$ See *Potassium tartrates.*
C_4H_5N (See also *Pyrrole.*)
β-Butenonitrile, 708[9].
Crotononitrile, 708[9].
$C_4H_5NO_2$ Acetic acid, cyano-, Me ester, 49[3].
C_4H_5NS Isothiocyanic acid, allyl ester, 2028[9].
Thiophenine, 2854[8].
$C_4H_5N_3O$ Cytosine, 1257[3], 3303[4].
$C_4H_5N_3O_2$ Urea, α-cyanoacetyl-, 1216[6].
$C_4H_5N_3O_3$ 5-Imidazolol, 1-methyl-4-nitro-, 1805[4].
$C_4H_5N_3O_4$ Hydroxonic acid, *salts*, 1386[9].
$C_4H_5N_5Ni_2O_3$, 1768[3].
C_4H_6 See *Bivinyl.*
$C_4H_6AsNO_3$ Pyrrolearsonic acid, 387[9].
$C_4H_6As_2O_4$ Acetic acid, arsenobis-, 40[6].
$C_4H_6BaO_4$ See *Barium acetate.*
$C_4H_6BeO_4$ Beryllium acetate, 1396[9].
$C_4H_6Br_2O$ Ether, dibromovinyl ethyl, 3155[7].
$C_4H_6Br_3ClO$ Ether, ethyl tribromochloroethyl, 3155[7].
$C_4H_6Br_4O$ Ether, ethyl tetrabromoethyl, 3155[7].
$C_4H_6Cd_2N_2O_6$ + $3H_2O$, 720[2].
$C_4H_6ClNO_3$ Succinamic acid, α-chloro-, 3281[4].
$C_4H_6Cl_2O_2$ Acetic acid, dichloro-, ethyl ester, 1751[7], 2455[9].
Butyric acid, γ,γ-dichloro-, 41[1].
$C_4H_6Cl_3NO_3$ Carbamic acid, *N*-(β-trichloro α-hydroxyethyl)-, Me ester, 41[1].
$C_4H_6Cl_4O$ Ether, ethyl tetrachloroethyl, 3155[6].
$C_4H_6HgO_4$ See *Mercury acetate.*
$C_4H_6MgO_4$ See *Magnesium acetate.*
$C_4H_6NO_6P$ 1,3-Propanediol, 2-(hydroxymethyl)-2-nitro-, bicyclophosphate, 2307[9].
$C_4H_6N_2$ Cyanamide, methylvinyl-, 2862[9].
$C_4H_6N_2O$ 2,5-Piperazinedione, 2502[2].
5-Pyrazolone, 3-methyl-, 1989[8].
$C_4H_6N_2OS$ Hydantoin, 5-methyl-2-thio-, 1980[9], 3298[9].
2(3)-Imidazolone, 4-hydroxy-5-methyl-2-thio-, 1980[9].
$C_4H_6N_2O_2$ (See also *Piperazinedione.*)
Hydantoin, methyl-, 3030[2], 3691[2].
2,5 Pyrazinediol, 1,4-dihydro-, 57[9].
$C_4H_6N_2O_3$ 4-Imidazolecarboxylic acid, tetrahydro-2-keto-, 2983[3].
$C_4H_6N_2O_3S$ 4(or 5)-Imidazolesulfonic acid, 2 methyl-, 415[4].
$C_4H_6N_2S_2$ 2,5-Piperazinedione, dithio-, 3746[4].
$C_4H_6N_4O_3$ See *Allantoin.*
C_4H_6O 3-Butin-2-ol, 3444[2].
Crotonaldehyde, 1594[2], P 2167[9], P 2504[3], P 3696[7].
$C_4H_6O_2$ (See also *Crotonic acid.*)
β-Butenic acid, 708[9].
Δ^3-2-Butenone, 4-hydroxy-, 3006[1].
Isocrotonic acid, 708[9]; *Tl salt*, 2818[3].
$C_4H_6O_3$ (See also *Acetic anhydride; Acetoacetic acid.*)
Butyric acid, α-keto-, 56[5].
$C_4H_6O_4$ (See also *Succinic acid.*)
Acetyl peroxide, 1385[8].
Malonic acid, methyl-, 1871[3].
Oxalic acid, dimethyl ester, 737[7].
Oxalic acid, monoethyl ester, 3689[4].
$C_4H_6O_4Te$ Acetic acid, tellurobis-, *and di-NH_4 salt*, 2315[8].
$C_4H_6O_4Te_2$ Acetic acid, ditellurobis-, 2315[8].
$C_4H_6O_5$ See *Malic acid.*
$C_4H_6O_6$ See *Tartaric acid.*
$C_4H_6O_{10}S_2$ Glyoxal, disulfate, AcOH addn. compd., 2821[6].
$C_4H_7Bi_3NaO_{10}$, 1571[9].
C_4H_7Br Butene, bromo-, 545[3], 2975[1,2], 3155[5].
$C_4H_7BrO_2$ Acetic acid, β-bromoethyl ester, 2555[3].
$C_4H_7Br_3$ Butane, tribromo-, 2975[1,2].
$C_4H_7ClN_2O_2$ Glyoxime, chloromethyl-, mono Me ether, 746[8].
$C_4H_7ClO_2$ Acetic acid, β-chloroethyl ester, 1551[5], 2555[3].
—, chloro-, ethyl ester, 1751[7], 2455[9].
$C_4H_7Cl_2NO_2$ Carbamic acid, *N*-(β,β-dichloroethyl)-, Me ester, 41[1].
$C_4H_7Cl_3O$ 2-Butanol, 1-trichloro-, 1218[1].
Ether, chloromethyl β,β'-dichloroisopropyl, 3688[1].
Ether, ethyl trichloroethyl, 3155[6].
Isobutyl alcohol, trichloro-, 3512[3].
$C_4H_7Cl_3OTe$ β-Ketobutyltellurium trichloride, 413[8].
$C_4H_7CuNO_2$ 2-Butanone, 3-hydroxy-, oxime, Cu deriv., 1055[6].
$C_4H_7IN_2O$ Δ^2-Oxazoline, 2-amino-5-(iodomethyl)-, 2161[2].
$C_4H_7KN_2O_3$ Allophanic acid, ethyl ester, K deriv., 717[4].
C_4H_7NO Butyronitrile, β-hydroxy-, 2659[8].
Isobutyronitrile, α-hydroxy-, 1787[2].
$C_4H_7NO_2$ Alanine, *N*-methylene-, *Na salt*, 3283[3].
Glycine, *N*-ethylidene-, *Na salt*, 3283[4].
$C_4H_7NO_4$ See *Aspartic acid.*
$C_4H_7NO_6$ Tartramic acid, 1926[4].
C_4H_7NS Isothiocyanic acid, Pr ester, 2835[2].
$C_4H_7N_3O$ See *Creatinine*
$C_4H_7N_3O_2$ Hydantoin, 5-amino-3-methyl-, *salts*, 1387[3].
$C_4H_7N_3O_3$ Malonamic acid, *N*-(diaminomethylene)-, 206[6].
$C_4H_7N_3O_4$ Hydantoic acid, δ-carbamyl-, 2160[9].
C_4H_8 See *Butene; Isobutylene.*
$C_4H_8BaNO_6P$ 1,3-Propanediol, 2-(hydroxymethyl)-2-nitro-, Ba phosphate, 2308[1].
$C_4H_8BrN_3O$ Guanidine, α-(α-bromopropionyl)-, *bromoplatinate*, 1594[8].
$C_4H_8Br_2$ Butane, dibromo-, 2974[9].
$C_4H_8Br_2O$ 2-Butanone, dibromide, 361[8].
$C_4H_8Cl_2O$ 2-Butanone, dichloride, 361[8].
Ether, α,β-dichloroethyl ethyl, 757[9].
Ether, β,β'-dichloroisopropyl methyl, 376[7].
$C_4H_8Cl_2S$ See *Sulfide, bis(β-chloroethyl)-.*
$C_4H_8N_2$ Acetaldehyde, azine, 3682[6].

$C_4H_8N_2O_2$ Glyoxime, dimethyl-, 1042^{9}, 1365^{2}.
—, methyl-, mono-Me ether, 746^{8}.
$C_4H_8N_2O_3$ (See also *Asparagine; Glycine, glycyl-.*)
Hydantoic acid, β-methyl-, 3691^{2}.
$C_4H_8N_2O_4$ Bicarbamic acid, di-Me ester, 410^{6}.
Succinic acid, α,β-diamino-, 48^{9}; *and salts*, 2312^{3}, $2313^{1,2}$.
$C_4H_8N_4O_2$ Formamide, C,C′-azobis[N-methyl-, 3284^{8}.
$C_4H_8N_4O_3$ Hydantoamide, δ-carbamyl-, 2160^{9}.
C_4H_8O (See also *Butanone; Butyraldehyde.*)
Ethylene oxide, α,α-dimethyl-, 2834^{3}.
$C_4H_8O_2$ (See also *Butanone, hydroxy-; Butyric acid; Ethyl acetate; Isobutyric acid.*)
Aldol, P 3696^{7}.
Formic acid, propyl ester, 1551^{5}, 2657^{8}.
Propionic acid, methyl ester, 1551^{5}.
$C_4H_8O_3$ (See also *Butyric acid, hydroxy-.*)
Glycolic acid, Et ester, 2456^{1}.
Lactic acid, Me ester, 3279^{9}.
Peracetic acid, Et ester, 2455^{9}.
Propionic acid, α-methoxy-, *and Ag salt*, $2827^{6,7}$.
$C_4H_8O_5S$ Butyric acid, β-sulfo-, *and salts*, $1979^{1,2,4}$, $2182^{4,7}$
$C_4H_8S_2$ p-Dithiane, $3687^{2,3}$.
C_4H_9Br Butane, 1-bromo-, 39^{4}.
C_4H_9BrHg Isobutylmercuric bromide, 362^{2}.
C_4H_9BrMg Butylmagnesium bromide, 364^{1}.
Isobutylmagnesium bromide, 1081^{9}.
C_4H_9BrNSb Stibine, trimethyl-, bromocyanide, 2481^{9}
C_4H_9Cl Butane, 1-chloro-, 39^{4}.
C_4H_9ClO Ether, β-chloropropyl methyl, 1385^{9}.
C_4H_9HgI Butylmercuric iodide, 362^{2}.
Isobutylmercuric iodide, 362^{2}.
C_4H_9I Butane, iodo, 1551^{4}, 3156^{4}.
$C_4H_9IN_2O$ Δ²-Oxazoline, 2-amino-, methiodide, 2161^{1}.
C_4H_9Li Lithium butyl, 3688^{6}.
C_4H_9NO Acetamide, N-ethyl-, 2979^{6}.
Acetimidic acid, Et ester, 1218^{4}.
2 Butanone, oxime, *$ZnCl_2$ deriv.*, 1784^{9}.
$C_4H_9NO_2$ Alanine, N-methyl-, Cu salt, 3283^{3}.
Butyl nitrite, 333^{6}, 1654^{1}.
Butyric acid, amino-, 56^{6}, 1672^{3}, 3724^{4}.
$C_4H_9NO_4S$ Propanesulfonic acid, carbamyl-, *salts*, 1594^{9}.
$C_4H_9NS_2$ Carbamic acid, methyldithio, Et ester, 374^{1}.
$C_4H_9N_3O_2$ Glyoxime, aminomethyl-, mono-Me ether, 746^{9}.
α-Guanidinecarboxylic acid, Et ester, 2983^{8}.
$C_4H_9N_3O_4S$ 2-Propanesulfonic acid, 1-guanido-1-keto, 1594^{8}.
C_4H_9NaO Sodium butoxide, P 1814^{1}.
$C_4H_9O_5P$ Butyric acid, γ-phosphono-, *and salts*, 2979^{2}.
C_4H_{10} See *Butane*.
$C_4H_{10}AlI$ Diethylaluminum iodide, 361^{6}.
$C_4H_{10}Al_2I_4$ Ethylaluminum diiodide, 361^{6}.
$C_4H_{10}BiNO_{12}$ + H_2O, 1571^{9}.
$C_4H_{10}Br_2OZn$, 1184^{7}.
$C_4H_{10}ClPtS$, 1569^{9}.
$C_4H_{10}CrN_6S_4$, 2625^{9}.
$C_4H_{10}N_2$ (See also *Piperazine.*)
Butenediamine, 2961^{1}.
$C_4H_{10}N_2O_2$ Butyric acid, α,γ-diamino-, *and -HCl*, 2982^{6}.
Carbazic acid, Pr ester, *-HCl*, 1990^{6}.
Propionic acid, α,β-diamino-, Me ester, *and -HCl*, 2983^{3}.
$C_4H_{10}N_2S$ Pseudourea, trimethylthio-, 374^{7}, 3158^{8}.
$C_4H_{10}N_4O_2$ Biurea, β,β′-dimethyl-, 3284^{9}.
Glyoxime, diamino-, di-Me ether, 747^{1}.
$C_4H_{10}O$ See *Butyl alcohol; Ethyl ether; Isobutyl alcohol.*
$C_4H_{10}OS$ Ethyl mercaptan, β-ethoxy-, 737^{4}.
$C_4H_{10}O_2$ Butanediol, 930^{1}, 2980^{6}, 3444^{6}, 3688^{3}.
Ethyl peroxide, 177^{8}, 3747^{8}.
1,2-Propanediol, 2-methyl-, 2311^{2}.
$C_4H_{10}O_4$ See *Erythritol.*
$C_4H_{10}O_4S$ See *Ethyl sulfate.*
$C_4H_{10}S$ Ethyl sulfide, 278^{8}, 3747^{8}.
$C_4H_{10}Zn$ Zinc ethyl, 2468^{1}.
$C_4H_{11}AsO_2$ Arsinic acid, methylpropyl-, 1977^{9}.
$C_4H_{11}ClN_2O_2$ (Hydroxymethyl)trimethylammonium chloride, nitrite, *$AuCl_3$ compd.*, 1386^{5}.
$C_4H_{11}IOS$ β-Hydroxyethyldimethylsulfonium iodide, 1053^{8}.
$C_4H_{11}N$ Diethylamine, 372^{4}, 683^{2}, 1184^{9}, 2161^{5}, 2820^{7}.
$C_4H_{11}NO$ 2-Butanol, 4-amino-, 3688^{3}.
$C_4H_{11}NO_3$ Hydroxylamine, β,β-bis(β-hydroxyethyl)-, *and chloroplatinate*, 361^{3}.
$C_4H_{11}N_3$ Guanidine, trimethyl-, 582^{4}, 3158^{9}.
$C_4H_{11}O_2PS_2$ Diethyl dithiophosphate, 2816^{6}.
$C_4H_{12}AsI_3Sn$, 1570^{9}.
$C_4H_{12}Cl_4FeN$, 25^{5}.
$C_4H_{12}IN$ Tetramethylammonium iodide, 447^{3}.
$C_4H_{12}I_3NSn$, 1570^{9}.
$C_4H_{12}N_2$ (See also *Putrescine.*)
Base from spermine, 3172^{8}.
$C_4H_{12}N_2O_6S_2$ Methanesulfonic acid, dimethylhydrazobis-, *di-K salt*, 3156^{9}.
$C_4H_{12}N_6$ Guanidine, α,α′-ethylenebis-, *and salts*, $3690^{4,6}$.
$C_4H_{12}OSb_2$ Stibine oxide, dimethyl-, 2977^{3}.
$C_4H_{13}NO$ Tetramethylammonium hydroxide, 2025^{1}, 3747^{4}.
$C_4H_{13}NO_2$ Trimethylmethoxyammonium hydroxide, 535^{8}.
$C_4H_{16}Br_2CaO_4$, 1746^{2}.
$C_4H_{16}CaCl_2O_4$, 1746^{2}.
$C_4H_{16}Cl_5FeN_2$, 25^{4}.
$C_4H_{18}CuI_2N_4O$, 3401^{1}.
$C_4H_{20}CuI_2N_4O_2$, 3400^{9}.
$C_4H_{24}Cl_7FeN_4$ + $0.5H_2O$, 25^{4}.
$C_4H_{30}Co_2N_{10}O_{12}S$, 878^{2}.
$C_4HgK_2N_4$ Potassium mercury cyanide, 2798^{2}.
$C_4HgK_2O_8$ + $2H_2O$ Mercury potassium oxalate, 2466^{5}.
$C_4I_2K_4N_4PbS_4$ + $2H_2O$, 3657^{1}.
$C_4I_2N_4Na_4PbS_4$, 3657^{1}.
C_4I_4O Furan, tetraiodo-, 736^{8}.
C_4I_4S Thiophene, tetraiodo-, 736^{7}.
$C_4K_2N_4Zn$ Potassium zinc cyanide, 2798^{2}.
$C_4K_2O_8Pd$ + $4H_2O$ Palladium potassium oxalate, 2625^{4}.
$C_4Na_2O_8Pd$ + $2H_2O$ Palladium sodium oxalate, 2625^{4}.
C_4NiO_4 See *Nickel carbonyl.*
C_4S See *Carbon sulfides.*
C_5FeO_5 See *Iron carbonyl.*
$C_5HBr_6N_3O_8$ Isovaleric acid, α,β,γ,γ,γ′,γ′-hexabromo-α,γ,γ′-trinitro-, 363^{2}.
$C_5H_2BrClN_2O_2$ Pyridine, 5-bromo-2-chloro-3-nitro-, 764^{3}.
$C_5H_2FeN_5Na_2O$ Sodium aquoferricyanide, 1769^{8}.
$C_5H_2K_2N_4O_4$ 5,5′-Spirobi[hydantoin], di-K deriv., 2826^{6}.
$C_5H_3BiKO_8$ + $4H_2O$, 2962^{6}.
$C_5H_3BiNaO_8$ + $4H_2O$, 2962^{6}.

$C_5H_3Br_2NOS$ 2-Thiophenealdehyde, dibromo-, oxime, 2857[4].

$C_5H_3ClINO_2$ Pyridine, 2-chloro-5-iodoxy-, 764[3].

$C_5H_3Cl_2IN$ Pyridine, 2-chloro-5-iodo-, *I*-dichloride, 764[3].

$C_5H_3NO_4S$ 2-Thiophenecarboxylic acid, 4-nitro-, 2854[8].

$C_5H_3N_3O_5$ 4(1)-Pyridone, 3,5-dinitro-, 204[7].

$C_5H_4Ag_2N_4O_5$ Uric acid, 4,5-dihydro-4,5-dihydroxy-, di-Ag deriv., 2826[6].

C_5H_4BrN Pyridine, 3-bromo-, *chloroplatinate*, 741[9].

$C_5H_4Br_4$, 3559[6].

C_5H_4IN Pyridine, 3-iodo-, *and salts*, 742[1].

$C_5H_4N_2O_3$ 2-Pyridol, 5-nitro-, 395[8].
  4(1)-Pyridone, 3-nitro-, 204[7].

$C_5H_4N_2O_4$ 4,5-Imidazoledicarboxylic acid, 415[6].

$C_5H_4N_4O$ See *Hypoxanthine; Sarcine.*

$C_5H_4N_4O_2$ See *Xanthine.*

$C_5H_4N_4O_3$ See *Uric acid.*

$C_5H_4N_4O_4$ Pyridine, 2-amino-3,5-dinitro-, 395[8].
  —, 3-nitro-2-nitramino-, 396[5].

$C_5H_4N_6O_2S$ Alloxan, cyclic thiocarbohydrazone, 1810[8].

$C_5H_4O_2$ (See also 2-*Furaldehyde.*)
  1,4-Pyrone, 1991[5].

$C_5H_4O_3$ Pyromucic acid, 2491[7], 3293[6]

$C_5H_5AgN_2O_2$ Uracil, 3-methyl-, Ag deriv., 1812[7].

$C_5H_5Ag_2N_5O_4$ Uric acid, 5-amino-4,5-dihydro-4-hydroxy-, di-*Ag* deriv., 2826[5].

$C_5H_5BrN_2O_2$ Pyrazolecarboxylic acid, 4-bromomethyl-, 2857[1].

C_5H_5BrO 1-Penten-4-in-3-ol, 2-bromo-, 3444[3].

C_5H_5BrS Thiophene, 2-(bromomethyl)-, 390[5].

C_5H_5ClO Ethylene oxide, α-(chloromethyl)-β-ethinyl-, 576[9].

$C_5H_5CoMoNO_4 + 2H_2O$ Cobalt pyridine molybdate, 1185[1].

$C_5H_5IO_2$ α,γ-Pentadienaldehyde, δ-hydroxy-γ-iodo-, 741[9].

$C_5H_5IO_4$ 1,2-Cyclopropanedicarboxylic acid, 1-iodo-, 48[9].

$C_5H_5KN_4O_5$ Uric acid, 4,5-dihydro-4,5-dihydroxy, K deriv., 2826[6].

$C_5H_5KO_{10}Th$ Potassium pentaformatothoriate, 1569[6].

C_5H_5N See *Pyridine.*

C_5H_5NO 4(1)-Pyridone, 1991[5].
  2-Pyrrolealdehyde, 597[5].

$C_5H_5NO_2$ 2-Pyrrolecarboxylic acid, 2493[1,2].

$C_5H_5NO_2S$ Thiophene, 2-methyl-?-nitro-, 1079[1].
  2-Thiophenecarboxylic acid, 4-amino-, *and -HCl*, 2854[9].

$C_5H_5NO_3S$ 1-Hydroxypyridiniumsulfonic acid, cyclic anhydride, 3009[6].

$C_5H_5NS_2$ 2-Pyrrolecarboxylic acid, dithio-, *and Pb salt*, 2493[1].

$C_5H_5N_3O_3$ 4(1)-Pyridone, 3-amino-5-nitro-, *and -HCl*, 204[7].
  5-Pyrimidinecarboxylic acid, 2-amino-1,4-dihydro-4-keto-, 206[6].

$C_5H_5N_5$ See *Adenine.*

$C_5H_5N_5O$ See *Guanine.*

$C_5H_5NaO_2$ α,γ-Pentadienaldehyde, δ-hydroxy-, Na deriv., 741[9].

C_5H_6 Cyclopentadiene, 2091[8].

$C_5H_6AgN_3O_3 + H_2O$ Hydantoin, 5-acetamido-, Ag deriv., 1387[1].

$C_5H_6BrNO_2$ Succinimide, *N*-(bromomethyl)-, 365[6].

$C_5H_6Br_4$ Compd., m. 77–9°, from 1-penten-4-in-3-ol, 1978[3].

$C_5H_6Br_6O$ Pentanol, hexabromo-, 3444[3].

$C_5H_6ClNO_2$ Succinimide, *N*-(chloromethyl)-, 365[6].

$C_5H_6ClNO_4$ Valeric acid, δ-chloro-γ,δ-diketo-, δ-oxime, 360[3].

$C_5H_6ClN_3$ Pyridine, 2-chloro-5-hydrazino-, 764[4].

$C_5H_6Cl_2N_2Pt$, 2961[2].

$C_5H_6Cl_2O$ 1-Pentin-3-ol, 4,5-dichloro-, 3444[3].

$C_5H_6Cl_6N_2O_2S$ Urea, α,β-bis(β-trichloro-α-hydroxyethyl)thio-, 41[1].

$C_5H_6Cl_6N_2O_3$ Urea, α,β-bis(β-trichloro-α-hydroxyethyl)-, 41[1].

$C_5H_6F_4FeN + H_2O$, 719[6].

$C_5H_6I_3NSn$, 1570[9].

$C_5H_6KN_5O_4$ Uric acid, 5-amino-4,5-dihydro-4-hydroxy-, K deriv., 2826[5].

$C_5H_6NNaO_4S$ Sulfamic acid, (ε-hydroxy-$\Delta^{2,4}$-pentadienylidene)-, Na deriv., *Na salt*, 3009[7]

$C_5H_6N_2$ (See also *Pyridine, amino-.*)
  Cyanamide, methylpropargyl-, 390[2].
  Glutaronitrile, 39[5].

$C_5H_6N_2O$ 4(1)-Pyridone, 3-amino-, *and salts*, 204[7].

$C_5H_6N_2OS$ Uracil, 6-methyl-2-thio-, 2681[9].

$C_5H_6N_2O_2$ 4-Imidazoleacetic acid, 2522[8].
  2,5-Piperazinedione, 3-methylene-, 381[5], 2682[6].
  5-Pyrazolecarboxylic acid, 1-methyl-, 2493[6].
  Thymine, 368[2], 3303[6].

$C_5H_6N_2O_4$ 5-Hydantoinacetic acid, 2010[9].

$C_5H_6N_2O_5$ Alloxanic acid, Me ester, 3691[4].

$C_5H_6N_3NaO_3 + H_2O$ Hydantoin, 5-acetamido, Na deriv., 1387[1].

C_5H_6O 1-Penten-4-in-3-ol, 1978[2], 3444[2].

$C_5H_6O_2$ 2-Furancarbinol, 2491[7], 2996[2], 3293[6].
  Glutaconaldehyde, 3009[6].
  Propiolic acid, ethyl-, 2978[1].

$C_5H_6O_4$ (See also *Citraconic acid; Mesaconic acid.*)
  Itaconic acid, 369[2].
  Succinic acid, α,β-epoxy-, 367[8].

$C_5H_6O_5$ Glutaric acid, keto-, 50[5], 56[6], 2179[1], 3155[1]; *Ba salt*, 2861[8].

C_5H_6S Thiophene, 2-methyl-, 1079[1].

$C_5H_7BiNO_8 + 3H_2O$, 2962[6].

C_5H_7Br 1-Pentine, 1-bromo-, 1783[1].

$C_5H_7BrCl_2O_2$ Propionic acid, α-bromo-α,β-dichloro, Et ester, 1054[4].

$C_5H_7BrN_2$ Pyrazole, 4-bromodimethyl-, 2494[6].

$C_5H_7Br_2ClO_2$ Propionic acid, α,β-dibromo-α-chloro-, Et ester, 1054[4].

$C_5H_7Br_3$, 3559[6].

$C_5H_7Br_3O_2$ Propionic acid, α,α,β-tribromo-, Et ester, 1054[4].

$C_5H_7ClN_4$ 3,5-Dimethyl-4-pyrazolediazonium chloride, 759[4].

$C_5H_7ClO_2$ 4-Pentine-2,3-diol, 1-chloro-, 577[1].

$C_5H_7Cl_3O_2$ Propionic acid, α,α,β-trichloro-, Et ester, 1054[4].

C_5H_7I 1-Pentine, 1-iodo-, 1783[3].

$C_5H_7KO_2 + 2H_2O$ Δ^3-2-Pentenone, 4-hydroxy-, K deriv., 741[9].

C_5H_7N Cyclopropaneacetonitrile, 3012[4].
  Pyrrole, 1-methyl-, 912[9]; *$HgCl_2$ deriv.*, 387[6].

C_5H_7NO Isoxazole, 3,5-dimethyl-, *$ZnCl_2$ deriv.*, 1785[1].

$C_5H_7NO_2$ Acetic acid, cyano-, Et ester, 42[7], 49[3].
$C_5H_7NO_3$ Glutimic acid, P 675[9].
Pyroglutamic acid, 2493[1,3].
Δ^4-2-Pyrrolinecarboxylic acid, 5-hydroxy-, 3169[5].
Succinimide, *N*-(hydroxymethyl)-, 365[6].
C_5H_7NS Thiocyanic acid, cyclopropylmethyl ester, 390[4].
$C_5H_7N_3$ Pyridine, 2,3-diamino-, 2499[4].
—, 4-hydrazino-, *and hydrochlorides*, 1807[3,4,5].
$C_5H_7N_3O$ Cytosine, 5-methyl-, 206[3].
$C_5H_7N_3O_2$ Δ^2-1-Pyrazolinecarboxamide, 5-keto-3-methyl-, 1990[5].
5-Pyrazolone, 3,4-dimethyl-1-nitroso-(?), 1990[8].
$C_5H_7N_3O_3$ Hydantoin, 5-acetamido-, 1387[1].
Pyrazole, 5-methoxy-3-methyl-4-nitro-, 2855[6].
$C_5H_7N_3O_4$ Hydroxonic acid, 3-methyl-, *and salts*, 1387[2].
4-Imidazolecarboxamide, tetrahydro-4-hydroxy-2,5-diketo-*N*-methyl-, 3691[5].
$C_5H_7N_5$ 1,2,4-Triazole, 5-diazo-3-isopropyl-, *chloroaurate*, 3294[1].
—, 5-diazo-3-propyl-, *chloroaurate*, 3294[1].
$C_5H_7N_5O_4$ Uric acid, 5-amino-4,5-dihydro-4-hydroxy-, *salts*, 2826[6].
$C_5H_7NaO_2$ Δ^3-2-Pentenone, 4-hydroxy-, Na deriv., 192[9], 741[3].
$C_5H_7NaO_4$ Malonic acid, di-Me ester, Na deriv., 2320[7].
C_5H_8 (See also *Isoprene.*)
Cyclopentene, 2113[1].
1,2-Pentadiene, 2145[9].
Piperylene, 2979[7].
$C_5H_8Br_2$ 2-Butene, 1,3-dibromo-2-methyl-, 38[9].
Pentene, dibromo-, 2146[1], 2979[8,9].
$C_5H_8Br_4$ Butane, tetrabromo-2-methyl-, 38[9], 39[1].
—, 1,2,3-tribromo-2-(bromomethyl)-, 38[9].
Pentane, 1,2,2,3-tetrabromo-, 2146[2].
$C_5H_8ClNO_2$ Isobutyryl chloride, *α*-keto-, oxime, 360[3].
$C_5H_8ClN_3$ *s*-Triazole, 3-chloro-5-isopropyl-, 3294[1].
—, 3-chloro-5-propyl-, 3294[1].
$C_5H_8Cl_2N_2O_3$ 2-Propanol, 1,3-dichloro-, allophanate, 50[8].
$C_5H_8Cl_2O_2$ Butyric acid, *γ,γ*-dichloro-, Me ester, 41[1].
$C_5H_8Cl_3NO_3$ Carbamic acid, *N*-(*β*-trichloro-*α*-hydroxyethyl)-, Et ester, 41[1].
$C_5H_8Cl_4N_2O$ Urea, *α,β*-bis(*β,β*-dichloroethyl)-, 41[1].
$C_5H_8Cl_4N_2S$ Urea, *α,β*-bis(*β,β*-dichloroethyl)thio-, 41[1].
$C_5H_8CuN_4O_4$ 5,5′-Spirobi[hydantoin], diamminocupric salt, 2826[6].
$C_5H_8N_2$ Pyrazole, dimethyl-, 2493[6,7], 2494[3].
$C_5H_8N_2O$ Pyrazole, 5-methoxy-3-methyl-, 2855[6].
5-Pyrazolone, 3,4-dimethyl-, 1990[3].
$C_5H_8N_2O_2$ 2,5-Piperazinedione, 3-methyl-, 915[8], 1087[5].
$C_5H_8N_2O_2Te$ 1,2-Telluropyran-3,5(4,6)-dione, dioxime, 2315[7].
$C_5H_8N_2O_3$ Hydantoin, 5-methoxy-1-methyl-, 1387[9].
$C_5H_8N_2O_4$ Thymine, dihydro-5,6-dihydroxy-, 368[3].
$C_5H_8N_4O_2S$ Hydantoin, 5-amino-3-methyl-, thiocyanate, 1387[3].
$C_5H_8N_4O_4S$ 3,5-Dimethyl-4-pyrazolediazonium sulfate, 759[4].
C_5H_8O 3-Butin-2-ol, 3-methyl-, 3444[3].
Cyclopentanone, 172[1], 1598[9], 2151[5].
Δ^3-2-Pentenone, 761[6].
$C_5H_8O_2$ Δ^3-2-Butenone, 4-hydroxy-3-methyl-, 2483[4].
2-Furaldehyde, tetrahydro-, 596[7].
2,4-Pentanedione, 1788[7].
α-Pentenic acid, 2978[1].
Valeric acid, *γ*-hydroxy-, lactone, 2980[6].
$C_5H_8O_3$ 2-Furancarboxylic acid, tetrahydro-, 2493[3].
Levulinic acid, 56[6].
$C_5H_8O_4$ (See also *Pyrotartaric acid.*)
Glutaric acid, 48[7], 2608[4].
Malonic acid, di-Me ester, 1408[7]; mono-Et ester, 3689[7]; mono-Et ester, *K salt*, 581[4].
—, dimethyl-, 1871[3].
—, ethyl-, 1871[3].
Oxalic acid, mono-Pr ester, 3689[5].
$C_5H_9AgN_4$ *s*-Triazole, 3-amino-5-isopropyl-, Ag deriv., 3293[7].
—, 3-amino-5-propyl-, Ag deriv., 3293[7].
C_5H_9Br Cyclobutane, (bromomethyl)-, 390[4].
Cyclopentane, bromo-, 1598[9].
Cyclopropane, (*β*-bromoethyl)-, 3012[4].
Pentene, bromo-, 2146[1], 3155[5].
C_5H_9BrO Δ^2-1-Butenol, 3-bromo-2-methyl-, 38[8].
$C_5H_9BrO_2$ Isovaleric acid, *α*-bromo-, 2310[3].
Propionic acid, *β*-bromo-, Et ester, 43[9].
$C_5H_9Br_3$ Butane, 1,2,3-tribromo-2-methyl-, 38[7].
Pentane, 1,2,3-tribromo-, 2146[1].
$C_5H_9ClN_2O_2$ Valeryl chloride, *α*-keto-, dioxime, 360[3].
C_5H_9ClO Ether, *β*-chloropropyl vinyl, 1386[1].
Pyran, 4-chlorotetrahydro-, 1624[5].
$C_5H_9ClO_2$ 2-Pentanone, 3-chloro-4-hydroxy-, 1786[9].
$C_5H_9Cl_2NO_2$ Carbamic acid, *N*-(*β,β*-dichloroethyl)-, Et ester, 41[1].
$C_5H_9Cl_3O$ 2-Pentanol, 1-trichloro-, 1218[1].
$C_5H_9Cl_3OTe$ *β*-Keto-*α*-methylbutyltellurium trichloride, 413[9].
$C_5H_9Cl_3O_2$ Propane, 1-chloro-2,3-bis(chloromethoxy)-, 3688[1].
C_5H_9I 2-Butene, 1-iodo-3-methyl-, 1057[7].
C_5H_9N Valeronitrile, 1216[8], 3705[1].
C_5H_9NO Butyronitrile, *α*-hydroxy-*α*-methyl-, 1787[3].
$C_5H_9NO_2$ (See also *Proline.*)
Glutamic acid, 56[6].
$C_5H_9NO_3$ (See also *Proline hydroxy-.*)
Alanine, *N*-acetyl-, 2983[4].
Levulinic acid, oxime, 41[9].
$C_5H_9NO_4$ See *Glutamic acid.*
C_5H_9NS Isothiocyanic acid, Bu and isobutyl esters, 2835[3].
$C_5H_9N_3$ (See also *Histamine.*)
Imidazole, 2-amino-4,5-dimethyl-, *and salts*, 193[7,8].
$C_5H_9N_5O$ 1,2,4-Triazole-5-isodiazohydroxide, 3-isopropyl-, 3293[9].
—, 3-propyl-, 3294[1].
$C_5H_9N_5O_3$ Uric acid, 4,5-dihydro-4,5-dihydroxy-, NH_4 deriv., 2826[6].
C_5H_{10} (See also *Cyclopentane.*)
2-Butene, 2-methyl-, 1049[9], 2820[2,3].
1-Pentene, 3443[9].

$C_5H_{10}BrN_3O$ Guanidine, α - (α - bromobutyryl)-, *salts*, 1594[8].
—, α - (α - bromoisobutyryl)-, *bromoplatinate*, 1594[8].
$C_5H_{10}Br_2$ Butane, 1,4 - dibromo - 2 - methyl-, 2990[2].
Pentane, 1,2-dibromo-, 3443[9].
$C_5H_{10}Br_2O_2$ 1,4 - Pentanediol, 2,3 - dibromo-, 3155[9].
$C_5H_{10}ClIO$ Ether, β - chloro - β′ - iodoisopropyl ethyl, 3688[1].
$C_5H_{10}Cl_2$ Butane, 1,4-dichloro-2-methyl-, 2990[3].
$C_5H_{10}Cl_2O$ Ether, β,β′ - dichloroisopropyl ethyl, 3688[1].
$C_5H_{10}N_2O_2$ Glutaramide, 1787[4].
Glyoxime, methyl-, di-Me ether, 746[7].
$C_5H_{10}N_2O_3$ Alanine, *N*-glycyl-, 3298[7].
Glycine, *N*-alanyl-, 3298[7].
Δ[2] - Oxazoline, 2 - amino-, acetate, 2161[1].
$C_5H_{10}N_4$ *s* - Triazole, 3 - amino - 5 - isopropyl-, *and salts*, 3293[7].
—, 3 - amino - 5 - propyl-, *and salts*, 3293[7].
$C_5H_{10}N_4O_4$ Hydroxonic acid, $MeNH_2$ salt, 1386[9]
$C_5H_{10}N_6O_4$ 5,5′ - Spirobi[hydantoin], NH_4 deriv., 2826[5].
Uric acid, 5 - amino - 4,5 - dihydro - 4 - hydroxy-, NH_4 deriv., 2826[5].
$C_5H_{10}O$ Cyclopentanol, 1598[9].
Ethylene oxide, trimethyl-, 2820[6,7].
Isovaleraldehyde, 587[5], 739[8], 2499[2]
Pentanone, 709[7], 739[3], 1602[4,6], 1985[9], 3157[5], 3747[8].
Pentenol, 360[9], 2146[2,4].
Pivalaldehyde, 1988[6].
Valeraldehyde, 2321[4].
$C_5H_{10}O_2$ (See also "ethyl ester" under *Propionic acid.*)
Acetic acid, isopropyl ester, 580[2], 2851[8]; Pr ester, 367[6], 1551[5], 2657[9], 2926[6].
2-Butanone, 3 - hydroxy - 3 - methyl-, 47[3].
Butyric acid, methyl ester, 3595[7].
—, α-methyl-, 41[8].
Carbon monoxide, di-Et acetal, 2824[9].
Ethylene oxide, α-ethoxy-α-methyl-, *and I-KI complex salt*, 2665[5]
Formic acid, butyl ester, 1551[5], 2657[9], isobutyl ester, 1551[5], 2657[8], 2926[6].
Isobutyric acid, methyl ester, 1551[5].
Isovaleric acid, 1051[7], 1742[9], 2608[5], *Tl salt*, 2818[2].
Pentanone, hydroxy-, 1593[3].
Δ[2] - 1,4 - Pentenediol, 2980[1].
Pivalic acid, *basic Be salt*, 3598[1].
4-Pyranol, tetrahydro-, 1624[5]
Valeric acid, 1051[7], 2321[4], 2834[3]; *Tl salt*, 2817[9].
$C_5H_{10}O_3$ Butyric acid, β - hydroxy-, Me ester, 2980[6].
Glycolic acid, Pr ester, 536[7].
Lactic acid, Et ester, 1787[7], P 3696[8], 3756[6].
$C_5H_{10}O_4$ Monoacetin, 690[6].
$C_5H_{10}O_5$ (See also *Arabinose.*)
Xylose, 2484[6].
$C_5H_{10}O_6$ Arabonic acid, 1058[4].
$C_5H_{10}S_3$ Carbonic acid, trithio-, di-Et ester, 1220[1].
$C_5H_{11}Br$ Butane, 1-bromo-3-methyl-, 39[4]
$C_5H_{11}BrHg$ Amylmercuric bromide, 362[3].
$C_5H_{11}BrO$ 2-Butanol, 3-bromo-2 (or 3)-methyl-, 2979[4].
$C_5H_{11}BrO_3S$ (Hydroxymethyl)dimethylsulfonium bromide, acetate, 1053[8], 2311[7].
$C_5H_{11}ClO$ 2-Butanol, 4 - chloro - 2 - methyl-, 1057[8].
Ether, butyl chloromethyl, 581[8].
Ether, chloromethyl isobutyl, 581[8].
Ether, β-chloropropyl ethyl, 1386[1].
$C_5H_{11}Cl_3O$ Addn. compd. of $CHCl_3$ and Et_2O, 3122[9].
$C_5H_{11}IO$ 2-Butanol, 4-iodo-2-methyl-, 1057[8].
$C_5H_{11}KO_4$ Δ[3] - 2 - Pentenone, 4 - hydroxy-, K deriv., dihydrate, 741[3].
$C_5H_{11}Li$ Lithium isoamyl, 3688[6].
$C_5H_{11}N$ Δ[2] - Isopentenylamine, *and* - *HCl*, 1057[8,9].
Piperidine, 372[3], 1086[6], 2802[4].
Pyrrolidine, 1-methyl-, 912[8].
$C_5H_{11}NO$ Acetamide, *N*-propyl-, 2979[6].
2-Butanol, 4-amino-, *and salts*, 2980[7].
2-Butanone, 3-methyl-, oxime, *$ZnCl_2$ deriv.*, 1784[9].
Butyraldehyde, β - methylamino-, *chloroaurate*, 1788[6].
Isovaleramide, 1054[9].
3-Pentanone, oxime, *$ZnCl_2$ deriv.*, 1784[9].
4-Piperidinol, 1991[5].
$C_5H_{11}NOS$ Thiomorpholine, 4 methyl-, 1-oxide, *and* - *HCl*, 40[1].
$C_5H_{11}NO_2$ (See also *Amyl nitrite; Betaine; Valine.*)
Alanine, Et ester, 2152[8].
Butyric acid, methylamino-, 56[6]
Isovaline, 213[8].
Valeric acid, γ-amino-, 56[6], 3724[1].
$C_5H_{11}NO_2S$ Glycine, α - propylmercapto-, *and Cu salt*, 924[3].
Thiomorpholine, 4 - methyl-, 1-dioxide, *and* - *HCl*, 40[1].
$C_5H_{11}NO_3$ 2-Butanol, 3-methyl-1-nitro-, 1052[2].
Carbamic acid, (ethoxymethyl)-, Me ester, 3284[4].
2-Pentanol, 1-nitro-, 1052[2].
$C_5H_{11}N_3O_2$ Glyoxime, aminomethyl-, di-Me ether, 746[9].
$C_5H_{11}N_3O_4S$ 2-Butanesulfonic acid, 1-guanido-1-keto-, 1594[8].
2-Propanesulfonic acid, 1-guanido 1-keto-2-methyl-, 1594[8].
$C_5H_{11}N_3S$ Acetone, 4-methylthiosemicarbazone, 416[6].
$C_5H_{11}N_5$ *s* - Triazole, 3(4) - hydrazino - 5 - propyl-, 3293[9].
$C_5H_{11}NaO_4$ Δ[3] - 2 - Pentenone, 4 - hydroxy-, Na deriv., dihydrate, 741[3].
$C_5H_{11}O_5P$ Propionic acid, β-phosphono-, Et ester, 2979[1].
C_5H_{12} See *Isopentane; Pentane*
$C_5H_{12}BrN$ Neurine, bromide, 364[5].
$C_5H_{12}CrN_9S_4$, 2625[9].
$C_5H_{12}N_2O_2$ (See also *Ornithine.*)
Valeric acid, γ-hydroxy-, hydrazide, 2980[7].
$C_5H_{12}N_2S$ Urea, s-diethylthio-, 2835[3].
$C_5H_{12}O$ See *Amyl alcohol; Isoamyl alcohol.*
$C_5H_{12}OS$ Propyl mercaptan, γ-ethoxy-, 737[2].
$C_5H_{12}O_2$ Butanediol, methyl-, 2990[4], 3158[2].
1,2,3,4-Pentanetetrol(?), 3156[1].
$C_5H_{12}O_3$ Propanediol, ethoxy-, 3688[2].
1-Propanol, 2,3-dimethoxy-, 376[7].
$C_5H_{12}O_4$ See *Pentaerythritol.*
$C_5H_{12}S$ Isoamyl mercaptan, 1784[3].
$C_5H_{12}Zn$, 2468[1].
$C_5H_{13}AsClNO$ (β - Arsinosoethyl)trimethylammonium chloride, 364[5].
$C_5H_{13}AsCl_3N$ (β - Dichloroarsylethyl)trimethylammonium chloride, 364[5].
$C_5H_{13}BrN_2O_3$ Trimethyl(β - nitrooxyethyl)ammonium bromide, 2311[6].

$C_5H_{13}ClN_2O$ (Carbamylmethyl)trimethylammonium chloride, 3688^{9}.

$C_5H_{13}Cl_2NO_2P$ Compd. from choline chloride and $POCl_3$, 364^{6}.

$C_5H_{13}N$ Isoamylamine, 242^{1}, 1068^{8}.

$C_5H_{13}NO$ (See also *Neurine*.)
1-Butanol, 3-methylamino-, 1788^{6}.
1-Pentanol, 5-amino-, *and chloroplatinate*, 2658^{3}.
2-Propanol, 1-ethylamino-, *and salts*, 2821^{1}.

$C_5H_{13}NO_2$ See *Muscarine*.

$C_5H_{13}N_3$ Guanidine, α-ethyl-β,γ-dimethyl-, *and salts*, 3284^{7}.

$C_5H_{13}O_6P$ Glycerophosphoric acid, di-Me ether, *Ba salt*, 1219^{3}.

$C_5H_{14}N_2$ Cadaverine, 2658^{2}.
Putrescine, methyl-, 580^{6}; *di HCl*, 2990^{2}.

$C_5H_{14}N_4$ Agmatine, 213^{4}, 2025^{4}.

$C_5H_{14}N_6$ Guanidine, α-methyl-α,α'-ethylenebis-, *and chloroaurate*, 3159^{1}.
Vitiatine, *and chloroaurate*, 3159^{1}.

$C_5H_{15}As_5$ Pentarsenole, tetrahydropentamethyl-, 2994^{8}.

$C_5H_{15}NO_2$ (See also *Choline*.)
Trimethylethoxyammonium hydroxide, 535^{8}.

$C_5H_{16}NO_5P$ Choline, phosphate, 3014^{4}.

$C_5H_{16}N_2O_5$ Colamine, carbonate, 3014^{6}.

$C_5H_{17}Cu_2N_9O_4 + 2H_2O$ Uric acid, 5-amino-4,5-dihydro-4-hydroxy-, diamminocupric salt, 2826^{5}.

$C_5H_{20}CuI_2N_4O$, 3401^{1}.

$C_5H_{25}Mo_6N_{15}NiO_{19} + 12H_2O$, 1185^{4}.

$C_6Ba_2FeN_6$ See *Barium ferrocyanide*.

$C_6Br_2I_2O_2$ Quinone, 2,6-dibromo-3,5-diiodo-, 1610^{2}.

$C_6Br_3NO_4$ Quinone, 2,3,5-tribromo-6-nitro-, 1394^{6}.

$C_6Br_4O_2$ Quinone, tetrabromo-, 1394^{2}.

C_6Br_6 Benzene, hexabromo-, 852^{1}.

$C_6Ca_2FeN_6$ Calcium ferrocyanide, 1160^{6}.

$C_6Cl_3N_3O_6$ Benzene, 1,3,5-trichloro-2,4,6-trinitro-, 2317^{2}.

C_6Cl_6 Benzene, hexachloro-, 134^{4}, 852^{1}.

$C_6CoK_3N_5O$ Cobalt potassium carbonyl cyanide, 2467^{4}.

$C_6CoK_3O_{12}$, 1344^{8}.

$C_6Co_2FeN_6$ See *Cobalt ferrocyanide*.

$C_6CrK_3O_{12}$, 1344^{8}.

$C_6CrNa_2O_{12}$, 1344^{8}.

C_6CrO_6 See *Chromium carbonyl*.

$C_6Cu_2FeN_6$ See *Copper ferrocyanide*.

$C_6FeK_3N_6$ See *Potassium ferricyanide*.

$C_6FeK_4N_6$ See *Potassium ferrocyanide*.

$C_6FeN_6Na_4$ See *Sodium ferrocyanide*.

$C_6FeN_6Ni_2$ See *Nickel ferrocyanide*.

$C_6FeN_6Sn_2$ See *Tin ferrocyanide*.

$C_6FeN_6Sr_2$ See *Strontium ferrocyanide*.

$C_6Fe_2KN_6$ See *Prussian blue*.

$C_6Fe_3N_6$ See *Iron ferrocyanide*.

$C_6HBrCl_2N_2O_5$ Phenol, bromodichloro-3,5-dinitro-, $2841^{2,3}$.

$C_6HBr_2ClN_2O_5$ Phenol, 2,6-dibromo-4-chloro-3,5-dinitro-, 1610^{1}.

$C_6HBr_2ClO_2$ Quinone, dibromochloro-, 2841^{3}.

$C_6HBr_2Cl_2NO_3$ Phenol, dibromodichloro-5-nitro-, $2841^{3,4}$.

$C_6HBr_2I_3O$ Phenol, 3,5-dibromo-2,4,6-triiodo-, 1610^{2}.

C_6HBr_3ClIO Phenol, 2,4,6-tribromo-3-chloro-5-iodo-, 3449^{2}.

$C_6HBr_3ClNO_3$ Phenol, 2,3,6-tribromo-4-chloro-5-nitro-, 1610^{1}.

$C_6HBr_3INO_3$ Phenol, 2,4,6-tribromo-3-iodo-5-nitro-, 3449^{1}.

$C_6HBr_3I_2O$ Phenol, 2,4,6 tribromo-3,5-diiodo-, 3449^{1}.

C_6HBr_4ClO Phenol, 2,3,4,6-tetrabromo-5-chloro-, 3449^{2}.

C_6HBr_4IO Phenol, 2,3,4,6-tetrabromo-5-iodo-, 3449^{2}.

$C_6HCl_3N_2O_4$ Benzene, 1,3,5-trichloro-2,4-dinitro-, 2317^{2}.

$C_6HCl_3N_2O_5$ Phenol, 2,4,6-trichloro-3,5-dinitro-, 1609^{8}.

$C_6HCl_5O_4S_2$ *m*-Benzenedisulfonyl chloride, 4,5,6-trichloro-, 2841^{7}.

$C_6HN_5O_{10}$ Benzene, pentanitro-, 2317^{2}.

$C_6H_2AgBrN_2O_5$ Phenol, bromodinitro-, Ag deriv., 1064^{5}.

$C_6H_2BrCl_3O$ Compd., decomps. about 114°, from 4-bromo-2,6-dichlorophenol and Cl, 1064^{2}.

$C_6H_2BrN_3O_5$ Benzene, 1-bromo-3,5-dinitro-2-nitroso-, 2666^{8}.

$C_6H_2BrN_3O_6$ Benzene, 1-bromo-2,3,5-trinitro-, 2666^{8}.

$C_6H_2BrN_3O_7$ Phenol, 3-bromo-2,5,6-trinitro-, 1064^{6}.

$C_6H_2BrN_3O_{10}S$ 1-Phenol-4-sulfonic acid, 3-bromo-2,5,6-trinitro-, *K salt*, 1064^{6}.

$C_6H_2Br_2Cl_2O$ *p*-Benzenone, dibromodichloro-, $2841^{2,3}$.
Phenol, dibromodichloro-, $2841^{2,3}$.

$C_6H_2Br_2N_2O_5$ Phenol, 3,5-dibromo-2,4-dinitro-, 1609^{8}.

$C_6H_2Br_3ClO$ *p*-Benzenone, 2,4,6-tribromo-4-chloro-, 1610^{1}.
Compd., decomps. about 115° from 2,6-dibromo-4-chlorophenol and Br, 1064^{2}.
Phenol, 2,3,6-tribromo-4-chloro-, 1610^{1}.

$C_6H_2Br_4O$ Phenol, 2,4,6-tribromo-, bromide, 1064^{1}.

$C_6H_2ClN_3O_5$ *o*-Quinonimine, *N*-chloro-4,6-dinitro-, 1552^{4}.

$C_6H_2ClN_3O_6$ Picryl chloride, 1061^{8}, 1395^{6}.

$C_6H_2Cl_2KN_3O$ Benzazimidole, 5,6-dichloro-, K deriv., 750^{7}.

$C_6H_2Cl_2N_2O_5$ Phenol, 3,5-dichloro-2,4-dinitro-, 1222^{8}.

$C_6H_2Cl_2N_4O_2$ Benzene, 1,2-dichloro-4-nitro-5-triazo-, 750^{7}.

$C_6H_2Cl_2N_4O_3$ Benzazimidol, 5,7-dichloro-6-nitro-, *and N_2H_4 salt*, 1222^{6}.

$C_6H_2Cl_3NO_2$ Benzene, 1,2,4-trichloro-5-nitro-, *N_2H_4 salt*, 750^{7}.

$C_6H_2N_4O_8$ Benzene, 1,2,4,5-tetranitro-, 2667^{9}.

$C_6H_2O_6$ Rhodizonic acid, *Na salt*, 1770^{7}.

$C_6H_3AsCl_2N_2O$ *o*-Quinonediazide, 4-dichloroarsyl-, *and HCl*, 2487^{1}.

$C_6H_3AsINO_4$ Phenol, 4-arsinoso-2-iodo-6-nitro-, 3289^{3}.

$C_6H_3BrCl_2$ Benzene, 4-bromo-1,2-dichloro-, 2152^{4}.

$C_6H_3BrCl_2O$ Phenol, 4-bromo-2,6-dichloro-, 1064^{2}.

$C_6H_3BrI_2O$ Phenol, 4-bromo-2,6-diiodo-, 2841^{3}.

$C_6H_3BrNNaO_3$ Phenol, 3-bromo-2-nitro-, Na deriv., 1064^{3}.

$C_6H_3BrN_2O_4$ Benzene, 1-bromo-2,4-dinitro-, 750^{1}.

$C_6H_3BrN_2O_5$ Phenol, bromodinitro-, 1064^{6}.

$C_6H_3BrOS_3$ Benzotrisulfole, 5-bromo-, 2-oxide, 1797^{9}.

$C_6H_3BrS_2$ *o*-Phenylene disulfide, 4-bromo-, 1797^{8}.

$C_6H_3Br_2ClO$ Phenol, 2,6-dibromo-4-chloro-, 1064^{2}, 1609^{9}.

$C_6H_3Br_2IO$ Phenol, 2,4-dibromo-6-iodo-, 2841[4].
$C_6H_3Br_3O$ Phenol, tribromo-, 1610[4], 2669[5].
$C_6H_3ClINO_2$ Benzene, 1-chloro-4-iodo-2-nitro-, 2152[4].
$C_6H_3ClI_2O$ Phenol, 4-chloro-2,6-diiodo-, 1610[1].
$C_6H_3ClKN_3O$ Benzazimidole, 5-chloro-, K deriv., 750[5].
$C_6H_3ClN_2O_4$ Benzene, 1-chloro-2,4-dinitro-, 2556[4].
$C_6H_3Cl_2F$ Benzene, 1,2-dichloro-4-fluoro-, 2152[4].
$C_6H_3Cl_2I$ Benzene, 1,2-dichloro-4-iodo-, 2152[4].
$C_6H_3Cl_2IO$ Phenol, 2,4-dichloro-6-iodo-, 2841[4].
$C_6H_3Cl_2NO$ Benzene, 1,2-dichloro-4-nitroso-, 2152[4].
Picolinyl chloride, chloro , 3294[4].
$C_6H_3Cl_2NO_2$ Benzene, 1,2-dichloro-4-nitro-, 2152[4].
$C_6H_3Cl_2N_3O$ Benzazimidole, 5,6-dichloro-, 750[7].
$C_6H_3Cl_2NaO$ Sodium phenoxide, 2,4-dichloro-, 2840[8].
$C_6H_3Cl_3$ Benzene, trichloro-, 2152[4], 2556[4].
$C_6H_3Cl_3O$ Phenol, 2,4,6-trichloro-, 2318[8], 2669[4].
$C_6H_3Cl_3O_7S_3$ 1,3,5-Benzenetrisulfonyl chloride, 2-hydroxy-, 1395[8].
$C_6H_3Cl_3O_8S_3$ 1,3,5-Benzenetrisulfonyl chloride, 2,4-dihydroxy-, 2841[7].
$C_6H_3Cl_4Hg_3N$ Aniline, 3-chloro-2,4,6-tri(chloromercuri)-, 2838[2].
$C_6H_3Cl_4N$ Compd., m. 89°, from 2,4,6-tris(acetoxymercuri)-3-chloroacetanilide, 2838[3].
$C_6H_3Cl_4N_2Sb$ 2-Chlorobenzenediazonium chloride, $SbCl_3$ inner complex salt, 2486[4].
$C_6H_3FeN_6$ See *Ferricyanic acid*.
$C_6H_3N_3O_6$ See *Benzene, trinitro-*.
$C_6H_3N_3O_7$ See *Picric acid*.
$C_6H_3N_3O_8$ Resorcinol, trinitro-, 3571[1].
$C_6H_3N_9$ Mellon, 3687[4].
$C_6H_4AgNO_4S_2$ *o*-Benzenedisulfonimide, Ag deriv., 3289[9].
C_6H_4AsBrO Benzene, arsinosobromo-, 393[4], 1606[3].
C_6H_4AsClO Benzene, 1-arsinoso-4-chloro-, 393[5].
$C_6H_4AsCl_3$ Arsine, dichloro(*p*-chlorophenyl)-, 393[6].
$C_6H_4AsCl_3N_2$ Benzenediazonium chloride, $AsCl_3$ inner complex salt, 2486[7].
$C_6H_4AsNO_4$ Phenol, 4-arsinoso-2-nitro-, 176[4].
C_6H_4BrClO Phenol, bromochloro-, 2152[9], 3449[1].
C_6H_4BrIO Phenol, 3-bromo-5-iodo-, 3449[2].
$C_6H_4BrKO_3S_2$ Benzenesulfonic acid, 5-bromo-2-mercapto-, K deriv., *K salt*, 1797[6].
$C_6H_4BrNO_2$ Benzene, bromonitro-, 386[5], 749[9], 1225[2], 2835[8], 3627[3].
Phenol, bromo-4-nitroso-, 178[4,5].
Quinone, 2-bromo-, 1-oxime, 178[4].
$C_6H_4BrNO_3$ Phenol, 3-bromo-2-nitro-, 1064[3].
$C_6H_4BrN_3O$ Benzazimidol, 6-bromo-, 3168[7].
$C_6H_4BrN_3O_5$ Hydroxylamine, β-(2-bromo-4,6-dinitrophenyl)-, 2666[7].
$C_6H_4Br_2ClN$ Aniline, 2,6-dibromo-4-chloro-, 2990[6].
$C_6H_4Br_2O$ Phenol, dibromo-, 2669[5].
$C_6H_4Br_2O_2$ Hydroquinol, dibromo-, 1394[2,3].
$C_6H_4Br_2O_4$ β-Resorcylic acid, dibromo-, 1613[3].
$C_6H_4Br_6$, 3075[2].
C_6H_4ClHgN Aniline, 2-chloro-4,5 (and 4,6) mercuri-, 589[4,5].
C_6H_4ClIO Phenol, chloroiodo-, 2152[9], 3449[2].
C_6H_4ClNO Isonicotinyl chloride, *and -HCl*, 3294[6].
Nicotinyl chloride, *and -HCl*, 3294[5].
Picolinyl chloride, 3294[4].
$C_6H_4ClNO_2$ (See also *Benzene, chloronitro-*.)
Picolinic acid, chloro-, 3294[4].
$C_6H_4ClN_3O$ Benzazimidole, chloro-, 750[4], 3168[7].
$C_6H_4ClN_3O_2$ Nitrobenzenediazonium chloride, 759[4].
$C_6H_4ClN_5O_5$ Hydrazine, α-(5-chloro-2,4-dinitrophenyl)-α-nitroso-, 750[5].
C_6H_4ClNaO Sodium phenoxide, chloro-, 2840[8].
$C_6H_4Cl_2$ See *Benzene, dichloro-*.
$C_6H_4Cl_2O$ Phenol, dichloro-, 2152[4], 2669[4].
$C_6H_4Cl_2O_3S$ Benzenesulfonic acid, 3,4-dichloro-, 2152[4].
$C_6H_4Cl_2O_5S_2$ *m*-Benzenedisulfonyl chloride, 4-hydroxy-, 1395[8].
$C_6H_4Cl_2O_6S_2$ *m*-Benzenedisulfonyl chloride, 4,6-dihydroxy-, 2841[7].
$C_6H_4Cl_3HgN$ Aniline, 2,4-dichloro-6-(chloromercuri)-, 2317[8].
$C_6H_4Cl_3Hg_2N$ Aniline, 2 chloro-4,6-bis(chloromercuri)-, 589[4].
$C_6H_4Cl_3N_2Sb$ Benzenediazonium chloride, $SbCl_3$ inner complex salts, 2486[6,8].
$C_6H_4FeN_6$ See *Ferrocyanic acid*.
$C_6H_4INO_2$ Phenol, 2-iodo-4-nitroso-, 178[7].
Quinone, 2-iodo-, 1-oxime, 178[6].
$C_6H_4INO_3$ Phenol, iodonitro-, 178[6], 3449[1].
$C_6H_4I_2$ Benzene, diiodo-, 3451[4].
$C_6H_4I_2Mg_2$ Phenylenedimagnesium diiodide, 3451[4].
$C_6H_4I_2N_2$ Piaziodonium iodide, *and hydrate*, 1239[4].
$C_6H_4I_3NO$ Ketone, 3,4,5-triiodo-2-pyrryl methyl, 597[4].
$C_6H_4KNO_3$ Phenol, *o*-nitro-, K deriv., 741[4].
$C_6H_4NNaO_3$ Phenol, *o*-nitro-, Na deriv., 741[3].
$C_6H_4N_2O_4$ See *Benzene, dinitro-*.
$C_6H_4N_2O_5$ See *Phenol, dinitro-*.
$C_6H_4N_2O_6$ Resorcinol, 4,6-dinitro-, 689[9].
$C_6H_4N_2Se$ Piaselenole, *perchlorate*, 2498[6].
$C_6H_4N_4O_6$ Picramide, 1061[6].
$C_6H_4N_6$ Addn. compd. of C_2N_2 and H, 2459[8].
$C_6H_4O_2$ See *Quinone*.
$C_6H_4O_5S_2$ *o*-Benzenedisulfonic anhydride, 3289[8].
$C_6H_4O_6$ Quinone, tetrahydroxy-, 3163[9].
$C_6H_4S_2$ *o*-Phenylene disulfide, 1797[7].
$C_6H_5AsO_2$ Arsinic acid, *p*-phenylene-, 2486[9].
C_6H_5Br See *Benzene, bromo-*.
C_6H_5BrMg See *Phenylmagnesium bromide*.
C_6H_5BrO Phenol, bromo-, 177[8], 1064[4].
$C_6H_5BrO_2$ Resorcinol, 4-bromo-, 3004[8,9].
$C_6H_5BrO_3S$ Benzenesulfonic acid, *p*-bromo-, *K salt*, 1018[7].
$C_6H_5BrO_6S_2$ *o*-Benzenedisulfonic acid, 4-bromo-, *di-K salt*, 1797[7].
$C_6H_5BrS_2$ *o*-Phenylenedimercaptan, 4-bromo-, 1797[6].
$C_6H_5Br_2N_3OS$ 2-Thiophenealdehyde, dibromo-, semicarbazone, 2857[4].
C_6H_5Cl See *Benzene, chloro-*.
C_6H_5ClHgO Phenol, *o*-(chloromercuri)-, 176[8].
C_6H_5ClIN, Aniline, 2-chloro-5-iodo-, 2152[6].
$C_6H_5ClN_2$ Benzenediazonium chloride, *addn. compd. with $BiCl_3$*, 1063[7].
$C_6H_5ClN_4O_4$ *m*-Phenylenediamine, 5-chloro-4,6-dinitro-, 1222[7].
C_6H_5ClO See *Phenol, chloro-*.
$C_6H_5ClO_2S$ Benzenesulfonyl chloride, 177[3], 1795[4].

$C_6H_5Cl_2HgN$ Aniline, 2-chloro-4-(chloromercuri)-, 589[2].
$C_6H_5Cl_2HgNO$ Aniline, 2,4-dichloro-6-(hydroxymercuri)-, 2317[8].
$C_6H_5Cl_2N$ Aniline, dichloro-, 2152[4], 2317[8].
$C_6H_5Cl_2NO$ Hydroxylamine, β-(3,4-dichlorophenyl)-, 2152[5].
$C_6H_5Cl_2N_3O_2$ Hydrazine, (dichloronitrophenyl)-, *and -HCl*, 750[6,8].
$C_6H_5Cl_2NSb$ Stibine, (3-amino-4-chlorophenyl)dichloro-, *-HCl*, 2486[4].
C_6H_5F See *Benzene, fluoro-*.
C_6H_5I See *Benzene, iodo-*.
$C_6H_5IN_2O$ Piaziodonium hydroxide, 1239[3].
C_6H_5IO Benzene, iodoso-, 584[5].
Phenol, *o*-iodo-, 177[9].
$C_6H_5IO_2$ Benzene, iodoxy-, 584[5].
$C_6H_5I_2NO$ Ketone, diiodo-2-pyrryl methyl, 597[4].
$C_6H_5KMoO_5 + 2H_2O$ Potassium monopyrocatecholatomolybdate, 3405[7].
C_6H_5KO Potassium phenoxide, 2840[7].
C_6H_5NO Benzene, nitroso-, 173[9].
C_6H_5NOS Aniline, sulfinyl-, 3162[9].
$C_6H_5NO_2$ (See also *Benzene, nitro-; Nicotinic acid.*)
Isonicotinic acid, *and derivs.*, 3294[5].
Phenol, *p*-nitroso-, 178[2], 2689[5].
$C_6H_5NO_2S$ Phenyl mercaptan, *o*-nitro-, 2976[6].
$C_6H_5NO_3$ See *Phenol, nitro-*.
$C_6H_5NO_4$ Resorcinol, 2-nitro-, 690[1].
$C_6H_5NO_5$ Pyrogallol, 5-nitro-, 1609[6].
$C_6H_5NO_5S_2$ *o*-Benzenedisulfonimide, *N*-hydroxy-, 3289[9].
$C_6H_5NO_6S$ Nitrophenylsulfuric acid, *K salt*, 1796[1,2].
C_6H_5NS Isothiocyanic acid, 2-thienylmethyl ester, 390[7].
$C_6H_5N_3O_3$ Aniline, *p*-nitro-*N*-nitroso-, 1627[7].
$C_6H_5N_3O_5$ See *Picramic acid*.
C_6H_5NaO Sodium phenoxide, 2840[8].
C_6H_5OTl Phenol, Tl deriv., 49[7].
C_6H_6 See *Benzene*.
$C_6H_6AsBrO_3$ Benzenearsonic acid, *o*-bromo-, 1606[3].
$C_6H_6AsCl_2N$ Arsine, (*p*-aminophenyl)dichloro-, 2486[7].
$C_6H_6AsCl_2NO$ Arsine, (3-amino-4-hydroxyphenyl)dichloro-, 2486[7].
C_6H_6AsI Arsine, iodophenyl-, 2994[2].
$C_6H_6AsNO_6$ Benzenearsonic acid, 4-hydroxy-3-nitro-, 266[6].
$C_6H_6BaO_{12}Th + 2H_2O$ Barium hexaformatothoriate, 1569[6].
C_6H_6BrN Aniline, *p*-bromo-, 1552[5].
C_6H_6BrNO Hydroxylamine, β-(*p*-bromophenyl)-, 745[9].
$C_6H_6BrNO_3S$ Benzenesulfonic acid, 2-amino-5-bromo-, 1797[6].
$C_6H_6BrN_3O_2$ *o*-Phenylenediamine, 2-bromo-5-nitro-, 2666[8].
$C_6H_6Br_2N_2O_4$ Glyoxime, dibromo-, di-Ac deriv., 2822[2].
$C_6H_6ClHgNO$ Aniline, 2-chloro-4-(hydroxymercuri)-, 589[2].
$C_6H_6ClHg_2NO_2$ Aniline, 2-chloro-4,6-bis(hydroxymercuri)-, 589[4].
$C_6H_6ClHg_3NO_3$ Aniline, 3-chloro-2,4,6-tris(hydroxymercuri)-, 2838[2].
C_6H_6ClN Aniline, chloro-, 538[2], 589[1], 1717[8], 2837[9].
$C_6H_6Cl_2NSb$, Stibine, (aminophenyl)dichloro-, *-HCl*, 2486[4,6].
$C_6H_6Cl_2O_4$ Malyl chloride, acetate, 1057[4].
C_6H_6Hg Propine, 1,1′-mercuribis-, 1054[1].
C_6H_6NNaO Sodium phenoxide, *o*-amino-, 2993[8].
$C_6H_6N_2Na_2O_2$ 2,5-Pyrazinediol, 3,6-dihydro-3-methyl-6-methylene-, di-Na deriv., 381[6].
$C_6H_6N_2O$ Aniline, nitroso-, 3574[8].
Picolinamide, chloro-, 3294[4].
$C_6H_6N_2O_2$ (See also *Aniline, nitro-*.)
Imidazoleacrylic acid, 3030[5].
Picolinic acid, 3-amino-, 393[2].
$C_6H_6N_2O_3$ Imidazolepyruvic acid, 3030[5].
2(1)-Pyridone, 1-methyl-3-nitro-, 396[6].
o-Quinone, 4,6-diamino-3-hydroxy-(?), 2842[5].
Quinonimine, 6-amino-2,3-dihydroxy-(?), 2842[5].
$C_6H_6N_2O_4S$ Benzenediazonium sulfate, 1627[7].
$C_6H_6N_4O_2S$ Sulfanilyl azide, *and -HCl*, 1409[8].
$C_6H_6N_4O_4$ Pyridine, 1,2-dihydro-1-methyl-3(and 5)-nitro-2-nitroimino-, 396[4,5].
$C_6H_6N_4O_6$ Hydroxylamine, β,β′-(4,6-dinitro-*m*-phenylene)bis-, 2667[7].
C_6H_6O See *Phenol*.
$C_6H_6O_2$ See *Hydroquinol; Pyrocatechol; Resorcinol*.
$C_6H_6O_2S$ Benzenesulfinic acid, 694[6].
$C_6H_6O_3$ (See also *Phloroglucinol; Pyrogallol.*)
1,2,4-Benzenetriol, 3656[5], 3665[5].
2-Furaldehyde, hydroxymethyl-, 214[3].
$C_6H_6O_3S$ See *Benzenesulfonic acid*.
$C_6H_6O_4$ Quinone, 2,3-dihydro-2,3-dihydroxy-(?), 3695[2].
$C_6H_6O_4S$ *p*-Phenolsulfonic acid, 689[2]; *Ba salt*, 394[5].
Phenylsulfuric acid, *salts*, 1796[8].
$C_6H_6O_4S_2$ *o*-Benzenedisulfinic acid, 3289[9].
$C_6H_6O_6$ Aconitic acid, 2983[5].
Benzenehexol, 3163[8].
2,2′-Bi[1,3-dioxolane]-4,4′-dione(?), 2821[4].
$C_6H_6O_8S_2$ Benzenedisulfonic acid, dihydroxy-, *K salt*, 3644[8].
$C_6H_6O_{12}SrTh + 2H_2O$ Strontium hexaformatothoriate, 1569[6].
C_6H_6S Phenyl mercaptan, 177[6], 2976[6].
$C_6H_6S_2$ *o*-Phenylenedimercaptan, 1797[5], 3289[8].
$C_6H_7AgN_2OS$ 4(3)-Pyrimidone, 2-(ethylmercapto)-, Ag deriv., 1812[7].
$C_6H_7Ag_2Cl_4IrN$, 2295[9], 3659[7].
$C_6H_7AsClNO_4$ *m*-Arsanilic acid, 5-chloro-4-hydroxy-, P 3299[8].
$C_6H_7AsINO_4$ *m*-Arsanilic acid, 4-hydroxy-5-iodo-, 1607[4]; *and salts*, 3289[2].
$C_6H_7AsNNaO_3$ See *Atoxyl*.
$C_6H_7AsNNaO_4$ *m*-Arsanilic acid, 4-hydroxy-, Na deriv., 2993[9].
$C_6H_7AsN_2O_6$ Arsanilic acid, 2-hydroxy-5-nitro-, 2318[4].
$C_6H_7AsO_4$ Benzenearsonic acid, *p*-hydroxy-, *Na salt*, 175[7].
$C_6H_7AsO_6S$ Benzenesulfonic acid, *p*-arsono-, 2839[2].
$C_6H_7As_2NO_9$ *m*-Benzenediarsonic acid, 4-hydroxy-?-nitro-, 393[1].
$C_6H_7BrN_2O_2$ Pyrazolecarboxylic acid, 4-bromodimethyl-, 2494[6].
$C_6H_7BrO_4$ Acetic acid, bromoglyoxyl-, Et ester, 388[7].
$C_6H_7ClN_2O$ Pyrazolecarboxylyl chloride, dimethyl-, 2857[1,2,3].
C_6H_7ClO Δ^2-Cyclohexenone, 2-chloro-, 1061[3].
$C_6H_7ClO_2$ Δ^2-Cyclohexenone, 2-chloro-3-hydroxy-, 1061[3].

$C_6H_7Cl_2N_5O$ Benzazimidole, 5,6-dichloro-, N_2H_4 salt, 750[7].
$C_6H_7Cl_5IrNTl_2$, 3659[7].
C_6H_7HgN Phenylmercuriamine, 1607[7].
$C_6H_7IN_2$ Hydrazine, (iodophenyl)-, 1794[8, 9].
$C_6H_7I_2N$ Pyrrole, diiododimethyl-, 596[9], 597[1].
$C_6H_7KMoO_7$ Potassium pyrogallolaquomolybdate, 556[9].
$C_6H_7KO_6W$ Potassium pyrocatecholaquotungstate, 557[2].
$C_6H_7KO_7W$ Potassium pyrogallolaquotungstate, 557[3].
$C_6H_7MoNaO_7$ Sodium pyrogallolaquomolybdate, 556[9].
$C_6H_7MoO_7Tl$ Thallium pyrogallolaquomolybdate, 557[1].
C_6H_7N (See also *Aniline.*)
Picoline, 1627[7], 2295[7], 2500[5]; *and salts*, 3659[6].
C_6H_7NO (See also *Phenol, amino-.*)
Hydroxylamine, β-phenyl-, 175[5], 2837[3].
4(1)-Pyridone, 1-methyl-, 1991[5]; *and $HgCl_2$ compd.*, 396[1, 2].
2-Pyrrolealdehyde, 3-methyl-, 3455[4].
$C_6H_7NO_2$ 5(4) - Oxazolone, 2-ethylidene-4-methyl-(?), 2682[5].
—, 2-ethyl-4-methylene-(?), 2682[5].
$C_6H_7NO_2S$ Phenylsulfoxylic acid, *o*-amino-, 2993[6].
$C_6H_7NO_3S$ Sulfanilic acid, 689[2].
C_6H_7NS Phenyl mercaptan, *o*-amino-, 386[6], 600[1].
$C_6H_7N_2NaOS$ Uracil, 5,6-dimethyl-2-thio-, Na deriv., 2681[9].
$C_6H_7N_3O_2$ Hydrazine, (*p*-nitrophenyl)-, 1604[2].
Pyridine, 1,2-dihydro-2-imino-5-nitro-, 396[2].
—, 1,2 - dihydro-1-methyl-2-nitroimino-, 396[3].
5 - Pyrimidinecarboxylic acid, 2-amino-4-methyl-, 206[5].
$C_6H_7N_5O_5$ Hydrazine, (5-hydroxamino 2,4-dinitrophenyl)-, 2667[5, 7].
$C_6H_7O_6TlW$ Thallium pyrocatecholaquotungstate, 557[2].
$C_6H_7O_7TlU$ Thallium pyrogallol aquouranate, 557[5].
$C_6H_7O_7TlW$ Thallium pyrogallolaquotungstate, 557[3].
C_6H_8 Benzene, dihydro-, 369[9].
$C_6H_8AsNO_3$ Arsanilic acid, 175[8].
$C_6H_8AsNO_4$ Arsanilic acid, hydroxy-, 393[1], P 2504[5], 3742[7]; *basic Bi salt*, 796[3]; *and -HCl*, 2993[9].
$C_6H_8AsNO_7S$ Benzenearsonic acid, 4-hydroxy-3-sulfamino-, *di-Ba salt*, 176[4].
$C_6H_8AsNO_{10}S_2$ Benzenearsonic acid, 4-hydroxy-3-sulfamino-5-sulfo-, *tri-Ba salt*, 176[4].
$C_6H_8As_2O_7$ *m*-Benzenediarsonic acid, 4-hydroxy-, *mono-Na salt*, 392[9].
$C_6H_8Br_2O_4$ Adipic acid, α,δ-dibromo , 581[6].
$C_6H_8ClN_3O_2$ 1,2,4 - Triazole-1-carboxylic acid, 3(or 5)-chloro - 5(or 3) - methyl , Et ester, 417[1].
$C_6H_8ClN_5O$ Benzazimidole, 5-chloro-, N_2H_4 salt, 750[4].
$C_6H_8CuN_2O_6$ Pyruvohydroxamic acid, Cu deriv., *salts*, 1978[7].
C_6H_8IN 1-Methylpyridinium iodide, 3008[9].
$C_6H_8IN_3O_2$ Pyridine, 2-amino - 5 - nitro-, methiodide, 396[4].
$C_6H_8I_2NSn$, 1570[9].
$C_6H_8MoO_7$ Pyrogallolaquomolybdic acid, 556[9].
$C_6H_8NO_3Sb$ Benzenestibonic acid, *p*-amino-, 1274[8].
$C_6H_8N_2$ (See also *Hydrazine, phenyl-; Phenylenediamine.*)
Picoline, 2-amino-, 395[8, 9].
Pyridine, 1,4-dihydro-4-imino - 1 - methyl-, *and salts*, 396[1, 2].
—, 4-methylamino-, *and chloroplatinate*, 396[1, 2]; *and salts*, 1238[6].
$C_6H_8N_2O$ Phenol, diamino-, 2301[1], 3452[5].
—, 2,4-diamino-, *-HCl*—see *Amidol.*
Pyrazolealdehyde, dimethyl-, 2857[1, 3].
$C_6H_8N_2O_2$ 2,5-Piperazinedione, 3-methyl-6-methylene-, 381[5], 2682[6, 7].
2,5 - Pyrazinediol, 3,6-dihydro-3-methyl-6-methylene-, 381[6].
Pyrazolecarboxylic acid, dimethyl-, 2493[5, 7], 2494[6].
$C_6H_8N_2O_2S$ Uracil, 5-(hydroxymethyl)-6-methyl-2-thio-, 2681[9].
$C_6H_8N_2O_2S_2$ Biphenyl, *p,p'* - bis(nitrosomercapto)-, 2975[9].
$C_6H_8N_2O_3$ Imidazolelactic acid, 2522[8], 3030[5].
Succinimide, α-acetamido-, 50[1].
$C_6H_8N_2O_3S$ Barbituric acid, 5-β-hydroxyethyl-2-thio-, 367[8].
Benzenesulfonic acid, *p*-hydrazino-, P 3696[4].
$C_6H_8N_2O_4$ Barbituric acid, 5-β-hydroxyethyl-, 367[8].
5-Hydantoinpropionic acid, 2010[9].
$C_6H_8N_2O_4S$ Sulfide, 2,4 dinitrophenyl phenyl, 1142[5].
$C_6H_8N_2O_5$ Alloxanic acid, Et ester, 3691[4].
4 - Imidazolecarboxylic acid, 4-ethoxytetrahydro-2,5-diketo-, 3691[6].
$C_6H_8N_2O_6S_2$ *m*-Benzenedisulfonamide, 4,6-dihydroxy-, 2841[7].
$C_6H_8N_4O_3$ Uracil, 6-amino-1-ethyl-5-nitroso-, 901[5].
$C_6H_8N_6O_4$ Benzene, 1,5-dihydrazino-2,4-dinitro-, *salts*, 750[6].
$C_6H_8N_6O_{18}$ Mannitol hexanitrate, 3043[7].
C_6H_8O Δ^2-Cyclohexenone, 1061[1].
$C_6H_8O_2$ (See also *Sorbic acid.*)
Δ^2-Cyclopentenone, 2-hydroxy - 3 - methyl-, 2484[6].
Propiolic acid, propyl-, 2978[1].
$C_6H_8O_4$ Lactide, 1787[7].
Succinic acid, glycol cyclic ester, 2823[4].
$C_6H_8O_5$ Adipic acid, α-keto , 1871[5].
$C_6H_8O_6$ Acetyl peroxide-succinic acid, 369[4].
Glucuronic acid, lactone, 2985[8].
Tricarballylic acid, 50[6].
$C_6H_8O_6U$ Pyrocatecholaquouranic acid, 557[5].
$C_6H_8O_7$ (See also *Citric acid.*)
Saccharic acid, monolactone, *Na salt*, 1057[9].
$C_6H_9AsN_2O_3$ Benzenearsonic acid, 3,4-diamino-, 1605[9].
$C_6H_9AsN_2O_4$ Benzenearsonic acid, 4,5-diamino-2-hydroxy-, 2318[6].
$C_6H_9Br_3O_3$ Paraldehyde, tribromo-, 362[4].
$C_6H_9Cd_2ClO_{10}$ + $3H_2O$, 720[2].
$C_6H_9ClN_2$ Imidazole, 5-chloro-1-ethyl-2-methyl-, *1624*[1].
$C_6H_9ClN_2O$ (See also *Amidol.*)
Isobutyronitrile, (α - chloroacetamido)-, 3299[2].
$C_6H_9ClO_2$ β-Pentenic acid, γ-chloro-α-methyl-(?), 2824[3].
$C_6H_9Cl_3O_2$ 2-Butanol, 1-trichloro-, acetate, 1218[1].
$C_6H_9IN_2$ 4 - Amino - 1 - methylpyridinium iodide, 1238[4].
C_6H_9N Pyrrole, dimethyl-, 1236[1], 3455[2]; *$HgCl_2$ deriv.*, 387[6].
C_6H_9NO *N*-Methylpyridinium hydroxide, 2025[4].

C_6H_9NOS Thiazole, 5-ethoxy-2-methyl-, 2679[7].
$C_6H_9N_3$ Hydrazine, (o-aminophenyl)-, *and -HCl*, 745[6,7].
$C_6H_9N_3O$ Pyrazolealdehyde, dimethyl-, oxime, 2857[1,2].
Pyrazolecarboxamide, dimethyl-, 2857[1,2,3].
$C_6H_9N_3O_2$ (See also *Cupferron; Histidine.*)
Δ^2 - 1 - Pyrazolinecarboxamide, 5-keto-3,4-dimethyl-, 1990[6].
Uracil, 6-amino-1-ethyl-, 901[5].
Urea, α-cyanoacetyl-β-ethyl-, 901[5].
$C_6H_9N_3O_2S$ Sulfanilic acid, hydrazide, *and di-HCl*, 1409[7,8].
$C_6H_9N_3O_3$ Hydantoin, 5-acetamido-3-methyl-, 1387[1].
Pyrazole, 5 ethoxy-3-methyl-4-nitro-, 2855[7].
$C_6H_9N_3O_4$ 4 - Imidazolecarboxamide, *N*-ethyl-tetrahydro-4-hydroxy-2,5-diketo-, 3691[5].
$C_6H_9N_5O$ Benzazimidole, N_2H_4 salt, 750[4].
$C_6H_9NaO_3$ + $2H_2O$ Acetoacetic acid, Et ester, Na deriv., 741[2].
$C_6H_9O_3Tl$ Acetoacetic acid, Et ester, Tl deriv., 49[7].
C_6H_{10} (See also *Cyclohexene.*)
Bicyclo[0.1.3]hexane, 406[6].
1,3-Butadiene, 2,3-dimethyl-, 3685[9].
1,2-Hexadiene, 3155[4].
$C_6H_{10}Br_2O_3$ Paraldehyde, dibromo-, 362[3].
$C_6H_{10}Br_4$ Bromination product from petroleum, 3559[6].
Hexane, tetrabromo-, 2146[5].
$C_6H_{10}Br_{12}Hg_6O_4$, 2295[6].
$C_6H_{10}ClNO_2$ Isovaleryl chloride, α-keto-β-methyl, oxime, 360[3].
$C_6H_{10}ClNO_3$ Carbamic acid, [β (chloroformyl)-isopropyl]-, Me ester, 44[3].
Isobutyric acid, (α-chloroacetamido)-, 3299[2].
$C_6H_{10}Cl_2O_2$ Propionic acid, 1,3-dichloropropyl ester, 2818[6].
$C_6H_{10}Cl_2O_2Te$ Bis(β-ketopropyl)tellurium dichloride, 413[8].
$C_6H_{10}MoNO_6$ Ammonium pyrogallolmolybdate, 3405[6].
$C_6H_{10}N_2$ Cyanamide, (cyclopropylmethyl)-methyl-, 390[3].
Pyrazole, 1-ethyl-3(and 5)-methyl-, 2494[2].
$C_6H_{10}N_2O$ Pyrazole, 5-ethoxy-3-methyl-, 2855[7].
-, 5-methoxy-3,4-dimethyl-, 2855[7].
5-Pyrazolone, 4-ethyl-3-methyl-, 1990[2].
—, 3,4,4-trimethyl-, 1990[2].
$C_6H_{10}N_2O_2$ Compd. from aminomethanesulfonic acid and Ac_2O, m. 90°, 3157[1].
1,2 - Cyclopentanedione, 3-methyl-, dioxime, 2484[9].
Glycine, *N*-(cyanomethyl)-, Et ester, 3283[2].
2,5-Piperazinedione, 3,6-dimethyl-, 1087[5], 1593[2], 2502[2].
Pyrazine, 1,4-dihydro 2,5-dimethoxy-, 57[9].
2,5 - Pyrazinediol, 1,4-dihydrodimethyl-, 3169[5].
$C_6H_{10}N_2O_2Te$ 1,2 - Telluropyran - 3,5(4,6)-dione, 2-methyl, dioxime, 413[6].
$C_6H_{10}N_2O_3$ Glyoxime, methyl-, mono-Me ether, Ac deriv., 746[8].
Hydantoin, 5-ethoxy-1-methyl-, 1387[8].
$C_6H_{10}N_2O_4$ Asparagine, N^{α}-acetyl-, 50[1].
$C_6H_{10}N_2O_5$ Allophanic acid, γ-(carboxymethyl)-, mono-Et ester, 2160[9].
Glutaric acid, α-carbamido-, 2010[9].
$C_6H_{10}N_2O_6$ Pyruvohydroxamic acid, dimer, 1978[8].
$C_6H_{10}N_4$ Cardiazole, 448[2], 3513[7].
$C_6H_{10}N_4O_2$ Uracil, 5,6-diamino-1-ethyl-, 901[6].
$C_6H_{10}N_6O_4$ 1,3,5 - Benzenetrihydrazine, 2,4-dinitro-, 1222[6].
$C_6H_{10}O$ Allyl ether, 361[8].
Cyclohexane, 1,2-epoxy-, 172[9], 1599[3].
Cyclohexanone, 1013[4], 2151[5], 2491[7].
Δ^2-Cyclohexenol, 1061[1], 1599[4].
Δ^5-2-Hexenone, 1602[5].
Mesityl oxide, 41[6], 739[8], 1593[5], 1784[2], 3157[4].
Resin alcohol from tobacco, 967[5].
$C_6H_{10}O_2$ Cyclopentanone, 2-hydroxy-3-methyl-, 2484[9].
α-Hexenic acid, 2978[1].
Δ^1-3-Hexenone, 1-hydroxy-, 1590[7], 2483[5].
2,4-Pentanedione, 3-methyl-, 44[9].
$C_6H_{10}O_3$ (See also "ethyl ester" under *Acetoacetic acid.*)
Isovaleric acid, α-keto-β-methyl-, 56[6].
4-Pentine-2,3-diol, 1-methoxy-, 577[1].
Propionic anhydride, 2670[2], 2818[7].
$C_6H_{10}O_3S$ Ethanol, β-mercapto-, diacetate, 737[4].
$C_6H_{10}O_3S_2$ Propionic acid, α-[(dithiocarboxy)-oxy]-, *S*-Et ester, 3280[9], 3281[1].
$C_6H_{10}O_4$ Adipic acid, 48[7], 2151[5], 2335[7], 2933[2], 2937[4]; *di-Ag salt*, 409[5].
Ethanediol, diacetate, P 1630[9], P 1995[6], P 3460[4], 3621[8].
Glycol, diacetate, 1978[8].
Malonic acid, mono-Pr ester, 3689[7].
Oxalic acid, di-Et ester, 46[9], 737[5], 1219[6], 1406[5], 3689[5].
Succinic acid, mono-Et ester, 3689[5]; *Ag salt*, 409[1].
$C_6H_{10}O_4Te_2$ Propionic acid, α,α'-ditellurobis-, 2670[2].
$C_6H_{10}O_5$ Glucosan, 743[1], 2522[8].
Malic acid, di-Me ester, 3279[9].
$(C_6H_{10}O_5)n$ See *Cellulose; Glycogen; Lichenin; Starch.*
$C_6H_{10}O_6$ Formic acid, dioxybis-, di-Et ester, 408[9].
β-Gluconolactone, 3445[9].
β-Mannonolactone, 3445[9].
Tartaric acid, mono-Et ester, *salts*, 2312[2].
$C_6H_{10}O_7$ (See also *Glucuronic acid.*)
Acid from β-diacetonefructose, 1388[5].
Galacturonic acid, 581[3]; *and salts*, 1389[3,4].
Gluconic acid, keto-, 1058[9], 1386[7].
$C_6H_{10}O_8$ Allomucic acid, 900[7].
Metasaccharic acid, 2986[5].
Mucic acid, 742[6], 787[3], 900[7], 1396[9]; *salts*, 1058[7,8].
Saccharic acid, 742[6], 1058[3], 2866[3].
$C_6H_{11}Br$ Cyclohexane, bromo-, 3160[1].
Cyclopentane, (bromomethyl)-, 3012[5].
$C_6H_{11}BrO$ Cyclohexanol, 2-bromo-, 1599[3], 2979[3].
$C_6H_{11}BrO_2$ 2 - Butanol, 3-bromo-2(or 3)-methyl-, formate, 2979[4].
Caproic acid, α-bromo-, 44[1].
$C_6H_{11}ClN_2O_2$ Isobutyramide, (α-chloroacetamido)-, 3299[2].
$C_6H_{11}ClO$ Cyclohexanol, 2-chloro-, 172[8].
$C_6H_{11}ClO_2$ 1,3-Cyclohexanediol, 2-chloro-, 1061[2].
2-Hexanone, 3-chloro-4-hydroxy-, 1786[9].
$C_6H_{11}ClO_{20}Th_3$ + $16H_2O$, 1569[6].
$C_6H_{11}ClO_{21}Th_3$ + $12H_2O$, 1569[6].
$C_6H_{11}Cl_3OTe$ β - Keto-γ,γ - dimethylbutyltellurium trichloride, 413[9].
$C_6H_{11}CuNO_2$ 3-Hexanone, 4-hydroxy-, oxime, Cu deriv., 1055[6].
$C_6H_{11}CuNO_6$ Fructose, oxime, Cu deriv., 1055[6].
$C_6H_{11}FO_5$ *d*-Glucosyl fluoride, 1221[7].
$C_6H_{11}IN_2$ Pyrazole, dimethyl-, methiodide, 2857[2], 3006[5].

$C_6H_{11}MoNO_7$ Ammonium pyrogallolaquomolybdate, 556[9].
$C_6H_{11}N$ Diallylamine, 44[9].
$C_6H_{11}NO$ Valeronitrile, α-hydroxy-α-methyl-, 1787[3].
$C_6H_{11}NO_2$ Hygric acid, 2982[8].
Valeramide, γ-hydroxy-, 2980[7].
$C_6H_{11}NO_3$ Alanine, *N*-acetyl-, Me ester, 2983[4].
$C_6H_{11}NO_3S$ Lactic acid, dimethylthionocarbamate, *and Ba salt*, 3281[2,5].
$C_6H_{11}NO_4$ Butyric acid, β-carbomethoxyamino-, 44[3].
$C_6H_{11}NO_6W$ Ammonium pyrocatecholaquotungstate, 557[2].
$C_6H_{11}NO_7U$ Ammonium pyrogallolaquouranate, 557[4].
$C_6H_{11}NO_7W$ Ammonium pyrogallolaquotungstate, 557[3].
$C_6H_{11}NO_{20}Th_3$ + $10H_2O$, 1569[6].
$C_6H_{11}NS$ Isothiocyanic acid, Am and isoamyl esters, 2835[3].
$C_6H_{11}N_3O_3$ Acetoacetic acid, Me ester, semicarbazone, 1990[5].
$C_6H_{11}N_3O_4$ Allophanic acid, γ-(carbamylmethyl)-, Et ester, 2160[9].
Hydantoic acid, δ-carbamyl-, Et ester, 2161[1].
$C_6H_{11}N_5O_3$ Uracil, 6-amino-1-ethyl-5-nitroso-, NH_4 deriv., 901[5].
$C_6H_{11}NaO_5$ Addn. compd. of NaOEt and di-Me oxalate, 737[7].
C_6H_{12} (See also *Cyclohexane.*)
Cyclopentane, methyl-, 171[2].
1-Hexene, 3444[1].
2-Pentene, 2-methyl-, 1649[9].
$C_6H_{12}Br_2$ Hexane, 1,2-dibromo-, 3444[1].
$C_6H_{12}Br_2Cl_2S$ Sulfide, bis(γ-chloropropyl), dibromide, 362[9].
$C_6H_{12}Br_2O_2$ Acetaldehyde, dibromo-, di-Et acetal, 1590[3].
$C_6H_{12}Br_3N$ β,γ-Dibromoallyltrimethylammonium bromide, 899[4].
$C_6H_{12}Cl_2O$ Ether, bis(β-chloropropyl), 1386[1].
$C_6H_{12}Cl_2O_2S$ Sulfone, bis(γ-chloropropyl), 362[9].
$C_6H_{12}Cl_2S$ Sulfide, bis(γ-chloropropyl), *and $PtCl_4$ addn. compd.*, 362[8].
$C_6H_{12}CoMoN_4O_4$ + $2H_2O$, 1185[2].
$C_6H_{12}CoMo_2N_4O_{10}$, 1185[2,3], 1195[2].
$C_6H_{12}I_2S_3$ *s*-Trithiane, 2,4,6-trimethyl-, diiodide, 578[6].
$C_6H_{12}MgMoN_4O_4$ + $10H_2O$, 1185[4].
$C_6H_{12}Mn_2Mo_2N_4O_{11}$ + $5H_2O$, 1185[4].
$C_6H_{12}N_2$ Acetone, azine, 899[9], 2309[5], 3282[6].
Isobutyronitrile α-dimethylamino-, 1053[7].
Propionaldehyde, azine, 899[9], 2309[5], 3282[8].
$C_6H_{12}N_2O_2$ Acetamide, α-acetamido-*N*-ethyl-, 1624[1].
Isobutyric acid, glycylamino-, 3299[2].
$C_6H_{12}N_2O_3$ Carbamic acid, (β-carbamylisopropyl)-, Me ester, 44[3].
$C_6H_{12}N_2O_4$ Bicarbamic acid, di-Et ester, 410[9].
2-Pentanol, 2-methyl-3-nitroso-, $-HNO_3$, 1050[9].
$C_6H_{12}N_2O_4S_2$ See *Cystine.*
$C_6H_{12}N_2O_5$ Arabinose, ureide, 1595[9].
Mannonic acid, lactone, hydrazide, 1059[9].
$C_6H_{12}N_2S_4$ Disulfide, bis(dimethylthiocarbamyl), 313[9].
$C_6H_{12}N_4$ See *Hexamethylenetetramine.*
$C_6H_{12}O$ (See also *Cyclohexanol.*)
Cyclopentanecarbinol, 1598[9].
Cyclopentanol, 2-methyl-, 1790[8,9].
Hexanone, 709[7], 1602[8], 3157[6].
Δ^{1}-3-Hexenol, 2146[2,4].
Pentanone, methyl-, 3157[6].
Pinacolin, 41[8].
$C_6H_{12}OS_2$ Dithiotriacetaldehyde, 2657[4].
$C_6H_{12}O_2$ Acetic acid, Bu ester, 536[6], 2657[9]; *sec*-Bu ester, 580[2]; isobutyl ester, 1551[5], 2657[9], 2851[8], 2926[6].
Butyric acid, ethyl ester, 1551[5], 2926[6].
—, α-ethyl-, *Tl salt*, 2818[2].
Caproic acid, 1051[7], 2374[8], 2533[9]; *salts*, 408[9], 2818[1], 3617[8].
Ethylene oxide, α-ethoxy-α,β-dimethyl-, 2665[6].
—, α-methyl-α-propoxy-, 2665[6].
Formic acid, Am and isoamyl esters, 2657[8,9].
2-Hexanone, 4-hydroxy-, 1593[8].
Isobutyric acid, Et ester, 1551[5], 2926[6].
2-Pentanone, 4-hydroxy-4-methyl-, 44[9], P 51[5].
Propionic acid, propyl ester, 1551[5].
$C_6H_{12}O_2S$ Monothiotriacetaldehyde, 2657[3].
$C_6H_{12}O_2S_3$ *s*-Trithiane, 2,4,6-trimethyl-, 1,3-dioxide, 579[1].
$C_6H_{12}O_3$ (See also *Metaldehyde; Paraldehyde.*)
Butyric acid, β-hydroxy-, Et ester, 1386[7].
1,2,3-Cyclohexanetriol, 1061[2].
2-Pentanone, 3,4-dihydroxy-4-methyl-, 3157[6].
$C_6H_{12}O_3S_3$ Trimethylenetrisulfoxide, 2,4,6-trimethyl-, 578[7].
$C_6H_{12}O_4$ Digitoxose, 208[9], 2724[4].
$C_6H_{12}O_4S$ Monothiotriacetaldehyde, sulfone, 2657[6].
Thiosugar from yeast, 583[3], 2314[6].
$C_6H_{12}O_5$ Lyxoside, α-methyl-, 1060[1].
Quercitol, 1222[4], 3161[4].
Rhamnose, 1059[8], 1981[3,5], 2987[2].
Xyloside, methyl-, 2314[3].
$C_6H_{12}O_5S$ *d*-Glucose, thio-, 2148[6].
$C_6H_{12}O_5S_2$ Dithiotriacetaldehyde, disulfone, 2657[6].
$C_6H_{12}O_6$ (See also *Fructose; Galactose; d Glucose; Inositol; Mannose; Scyllitol.*)
Glutose, 3692[1].
Gulose, 583[5].
Sorbose, 583[5].
$C_6H_{12}O_7$ Gluconic acid, 742[6], 1058[6], 2821[1], 2866[3], 2985[9], 2986[4], 3713[7].
Galactonic acid, *and Cd salt*, 2086[3,4].
Mannonic acid, 1058[6], 2985[9].
$C_6H_{12}O_8$ Gluconic acid, hydroxy-, *and Ca salt*, 2986[2].
$C_6H_{12}Pt_2S_6$, 1570[3].
$C_6H_{12}S_3$ *s*-Trithiane, 2,4,6-trimethyl-, 578[4].
$C_6H_{13}BrHg$ Hexylmercuric bromide, 362[2].
$C_6H_{13}BrO$ Ether, β-bromo-*tert*-amyl methyl(?), 2979[4].
—, β-bromo-α-methylisobutyl methyl (?), 2979[4].
$C_6H_{13}Br_2N$ γ-Bromoallyltrimethylammonium bromide, 899[3].
$C_6H_{13}Cl$ Pentane, 3-chloro-3-methyl-, 2481[4].
$C_6H_{13}ClO$ Ether, β-chloropropyl propyl, 1386[1].
$C_6H_{13}ClS_2$ Propyl mercaptan, γ-(γ-chloropropylmercapto)-, 737[5].
$C_6H_{13}Cl_2N$ γ-Chloroallyltrimethylammonium chloride, 899[4].
$C_6H_{13}I$ Pentane, 2-iodo-4-methyl-, 577[4].
$C_6H_{13}N$ Cyclohexylamine, 1600[9].
$C_6H_{13}NO$ Acetamide, *N*-butyl-, 2979[6].
Butyraldehyde, β-dimethylamino-, *chloroaurate*, 1788[4].
4-Piperidinol, 1-methyl-, 1991[5].
Valerimidic acid, Me ester, 1218[4].
$C_6H_{13}NOS$ Thiomorpholine, 4-ethyl-, 1-oxide, *and -HCl*, 40[1].

$C_6H_{13}NO_2$ (See also *Leucine.*)
Butyric acid, α-amino-β,β-dimethyl-, 2010[8].
Caproic acid, α-amino-, 44[8].
Glycine, Bu and isobutyl esters, *-HCl*, 1055[2].
Hedonal, 1279[6].
Isocaproamide, α-hydroxy-, 1786[5].
Isoleucine, 2147[5].
Norleucine, 2147[6].
Valeric acid, α-amino-α-methyl-, 368[1].
Valine, methyl-, 56[6], 368[2].
$C_6H_{13}NO_2S$ Thiomorpholine, 4-ethyl-, 1-dioxide, *and -HCl*, 40[2].
$C_6H_{13}NO_3$ Carbamic acid, (ethoxymethyl)-, Et ester, 3284[4].
2-Pentanol, 4-methyl-1-nitro-, 1052[2].
$C_6H_{13}NO_5$ Glucosamine, 742[4], 2662[5], 3125[6].
$C_6H_{13}NO_6$ Gluconic acid, 3-amino-, 2663[1]
$C_6H_{13}NS$ Ethylamine, *N*,*N*-dimethyl-β-vinylmercapto-, 40[2].
$C_6H_{13}N_3$ Galegine, 450[7], 1057[5].
$C_6H_{13}NaO_3$ Acetoacetic acid, Et ester, Na deriv., dihydrate, 741[2].
$C_6H_{13}O_5P$ Butyric acid, γ-phosphono-, Et ester, 2979[2].
$C_6H_{13}O_9P$ Glucosephosphoric acid, *and Ba salt*, 1979[7].
C_6H_{14} See *Hexane; Pentane, 2-methyl-.*
$C_6H_{14}BiNO_{10}$, 1571[8].
$C_6H_{14}BiN_3O_{14}$, 1571[8].
$C_6H_{14}BrNO_2$ (Carboxymethyl)trimethylammonium bromide, Me ester, 3688[8].
(Hydroxymethyl)trimethylammonium bromide, acetate, 2311[6].
$C_6H_{14}ClNO_2$ (Hydroxymethyl)trimethylammonium chloride, acetate, *and chloroplatinate*, 364[6].
$C_6H_{14}Cu_2I_2S_4$, 326[6].
$C_6H_{14}HgO_2S_2$ 1-Propanol, *S*,*S'*-mercuribis[3-mercapto-, 362[8].
$C_6H_{14}INO_2$ (Hydroxymethyl)trimethylammonium iodide, acetate, 364[6].
$C_6H_{14}MoN_2O_7 + nH_2O$, 3656[7].
$C_6H_{14}N_2$ Piperazine, dimethyl-, 1593[2], 2682[2]; *salts*, 398[3,4].
$C_6H_{14}N_2O_2$ 1,3-Dioxolane, 4-(hydrazinomethyl)-2,2-dimethyl-, 2816[1].
Lysine, 2311[6]; *and di-HCl*, 2982[5,6].
$C_6H_{14}N_2O_6$ Gluconic acid, hydrazide, 2987[1].
$C_6H_{14}N_2O_7W + nH_2O$, 3656[7].
$C_6H_{14}N_2O_{12}Th$ Ammonium hexaformatothoriate, 1569[6].
$C_6H_{14}N_2S$ Pseudourea, α-ethyl-α,β,γ-trimethylthio-, 374[8].
$C_6H_{14}N_4O_2$ See *Arginine.*
$C_6H_{14}N_6O_3$ 1,1,2-Propanetricarboxylic acid, trihydrazide, 1592[3].
$C_6H_{14}NaO_8P$ Phosphoric acid, diglyceride, Na salt, 2980[1].
$C_6H_{14}O$ Hexyl alcohol, 3280[2].
Isopropyl ether, 361[9].
2-Pentanol, 4-methyl-, 577[4].
Propyl ether, 361[9].
$C_6H_{14}O_2$ Acetal, 40[8], 3687[6].
Ethanol, 2-butoxy-, 1347[3].
—, 2-isobutoxy-, 1347[3].
Pinacol, 42[9], 3685[5].
$C_6H_{14}O_2S$ Propanol, thiobis-, 362[8], P 768[8].
$C_6H_{14}O_2S_2$ 1-Propanol, 3,3'-dithiobis-, 737[3].
$C_6H_{14}O_3$ 1,2,4-Pentanetriol, 4-methyl-, 3158[2].
Propane, 1,2,3-trimethoxy-, 376[8].
$C_6H_{14}O_3S$ 2-Pentanesulfonic acid, 4-methyl-, *Ba salt*, 577[6].
$C_6H_{14}O_4$ Glyoxal, tetra-Me acetal, 2821[3].
$C_6H_{14}O_4S$ Isopropyl sulfate, 1793[2].
$C_6H_{14}O_6$ (See also *Mannitol; Sorbitol.*)
Dulcitol, 369[1].
$C_6H_{14}S$ Isoamyl mercaptan, α-methyl-, 577[7].
Propyl sulfide, 278[6].
Sulfide, isopropyl propyl, 2991[2].
$C_6H_{14}S_2$ Propyl disulfide, 1784[2].
$C_6H_{14}Se_2$ Isopropyl diselenide, 3273[8].
$C_6H_{14}Zn$ Zinc ethyl isobutyl, 2468[1].
Zinc propyl, 2468[1].
$C_6H_{15}BrS$ Triethylsulfonium bromide, 1744[2].
$C_6H_{15}Cl_3IrN_3$, 2295[8].
$C_6H_{15}N$ Triethylamine, 3688[6].
$C_6H_{15}NO$ (See also *Homoneurine.*)
1-Butanol, 3-dimethylamino-, *and chloroaurate*, 1788[6].
Diethylamine, *N*-(methoxymethyl)-, *and -HCl*, 2309[6,8].
$C_6H_{15}NO_2$ Hydroxylamine, α,β-diethyl-β-(β-hydroxyethyl)-, *and chloroplatinate*, 361[3].
$C_6H_{15}NO_3$ Hydroxylamine, α-ethyl-β,β-bis(β-hydroxyethyl)-, *and chloroplatinate*, 361[3].
$C_6H_{15}NO_4$ Choline, carbonate, 3014[3].
Triethylamine, β,β',β'' - trihydroxy-, *N*-oxide, *and chloroplatinate*, 361[1,2].
$C_6H_{15}N_3$ Galegine, dihydro-, 450[7].
$C_6H_{15}O_2P$ Phosphine peroxide, triethyl-, 2976[8].
$C_6H_{15}O_6P$ Phosphoric acid, diglyceride, 2980[1].
$C_6H_{15}P$ Phosphine, triethyl-, 2976[8].
$C_6H_{16}FeN_{10}$ See *Ammonium ferrocyanide.*
$C_6H_{16}INO_4$ Triethylammonium periodate, 447[3].
$C_6H_{17}NO_3$ See *Neosine.*
$C_6H_{18}Br_2CaO_3$, 1746[2].
$C_6H_{18}CaCl_2O_3$, 1746[2].
$C_6H_{18}I_2N_4Pd$ Triaminotriethylaminepalladious iodide, 1[illegible]9[4].
$C_6H_{?}Mo_6N_4O_{20}$ + 10H_2O, 3405[7].
$C_6H_{18}Mo_6N_4O_{21}$ + 6H_2O, 3405[7].
$C_6H_{18}N_4$ Triethylamine, β,β',β''-triamino-, *salts*, 578[2,3,4], 1589[1,2,3,4], 1961[8].
$C_6H_{18}N_4NiO_4S$ Triaminotriethylaminenickelous sulfate, 1589[2].
$C_6H_{18}Sn_2$ Distannane, hexamethyl-, 2977[5].
$C_6H_{20}Cl_2FeN_2$, 25[5].
$C_6H_{20}Co_2N_8O_4S_6$ Tetraaquodiamminotrirubeanatodicobalt, 3690[4].
$C_6H_{21}CuI_2N_4O$, 3401[4].
$C_6H_{24}Br_3CoN_6$, 1344[8].
$C_6H_{24}Cl_3CoN_6$, 1344[8].
$C_6H_{24}CoI_3N_6$, 1344[8], 1961[9].
$C_6H_{24}Cl_2N_{12}O$, 155[7].
$C_6H_{24}Cr_2N_{10}O_{14}$ + 4H_2O, 716[8].
$C_6H_{24}CoN_{13}O_{12}$, 2924[3].
$C_6HgK_4O_{12}$ + 3H_2O Mercury potassium oxalates, 2466[5].
C_6I_6 Benzene, hexaiodo-, 736[9].
C_6N_6OPtU + 4H_2O Uranium cyanoplatinate (basic), 3139[7].
$C_6N_6O_{12}$ Benzene, hexanitro-, 2317[2].
C_6O_6 Triquinoyl, 3163[8].
$C_7H_2Cl_2N_2O_2$ Picolinic acid, 4,6-dichloro-5-cyano-, 915[2].
$C_7H_2Cl_2N_2O_5$ Benzoyl chloride, 2-chloro-3,5-dinitro-, 181[5].
$C_7H_3AlO_5$ Gallic acid, Al deriv., 406[1].
$C_7H_3BrClNOS$ 1 - Benzoxazolemercaptan, 6-bromo-4-chloro-, 194[2].
$C_7H_3BrCl_2N_2O_5$ Anisole, bromodichloro - 3,5-dinitro-, 2841[2,3].
$C_7H_3BrN_2O_6$ Benzoic acid, 2-bromo-3,5-dinitro-, 1229[7].
$C_7H_3BrS_3$ 1,3 - Benzodisulfol-2-one, 5-bromothio-, 1797[9].
$C_7H_3Br_2ClN_2O_5$ Anisole, 2,6 - dibromo-4-chloro-3,5-dinitro-, 1609[6].

$C_7H_3Br_2Cl_2NO_3$ Anisole, dibromodichloro-5-nitro-, 2841[3,4].
$C_7H_3Br_2I_3O$ Anisole, 3,5-dibromo-2,4,6-triiodo-, 1610[2].
$C_7H_3Br_2NO$ Benzisoxazole, 4,6-dibromo-, 403[8].
$C_7H_3Br_2NOS$ 1-Benzoxazolemercaptan, 4,6-dibromo-, 194[2].
$C_7H_3Br_3ClNO_3$ Anisole, 2,3,6-tribromo-4-chloro-5-nitro-, 1610[1].
$C_7H_3Br_3N_2O_5$ Anisole, tribromodinitro-, 1394[5], 1610[4].
$C_7H_3Br_4NO_3$ Anisole, 2,3,4,6-tetrabromo-5-nitro-, 1394[4].
$C_7H_3Cl_2N$ Benzonitrile, 3,4-dichloro-, 2152[4].
$C_7H_3NO_3S_2$ 1,3-Benzodisulfol-2-one, nitro, 3290[2].
$C_7H_3N_2NaO_3$ Salicylonitrile, 5-nitro-, Na deriv., 1230[4].
$C_7H_3N_3O_8$ Benzoic acid, 2,4,6-trinitro-, 182[1], 824[7].
C_7H_4BrNOS 1-Benzoxazolemercaptan, 4-bromo-, 194[2].
C_7H_4BrNSe Phenol, *p*-bromo-, selenocyanate, 3288[4].
$C_7H_4Br_2ClNO_3$ Anisole, 2,6-dibromo-4-chloro-3-nitro-, 1609[9].
$C_7H_4Br_2Cl_2O$ Anisole, dibromodichloro-, 2841[2,3].
$C_7H_4Br_2N_2O$ 1,4-Imidazopyridin-2(3)-one, 3,3-dibromo-, 2858[8].
$C_7H_4Br_2N_2O_5$ Anisole, 3,5-dibromo-2,4-dinitro-, 1609[8].
$C_7H_4Br_2N_2O_6$ Phenol, 3,5-dibromo-4-methoxy-2,6-dinitro-, 1394[6].
$C_7H_4Br_2N_6O$ *o*-Cresol, 4,6-dibromo-*α*,*α*-ditriazo-, 403[8].
$C_7H_4Br_3ClO$ Anisole, 2,3,6-tribromo-4-chloro-, 1610[1].
$C_7H_4Br_3NO_3$ Anisole, tribromonitro-, 1394[5].
$C_7H_4Br_4N_2O$ 1,4-Imidazopyridin-2(3)-one, 3,3-dibromo-, dibromide, *-HBr*, 2858[8].
C_7H_4ClNOS 1-Benzoxazolemercaptan, 4-chloro-, 194[2].
$C_7H_4ClNO_3$ Benzoyl chloride, *p*-nitro-, 182[1].
C_7H_4ClNS Isothiocyanic acid, *p*-chlorophenyl ester, 3288[3].
C_7H_4ClNSe Phenol, *p*-chloro-, selenocyanate, 3288[5].
$C_7H_4ClN_3O_5$ Benzamide, 2-chloro-3,5-dinitro-, 181[5].
$C_7H_4ClN_3O_7$ Anisole, 3-chloro-2,4,6-trinitro-, 1395[4].
$C_7H_4Cl_2HgO$ Benzoyl chloride, *p*-(chloromercuri)-, 1063[3].
$C_7H_4Cl_2N_2$ Nicotinonitrile, 2,4-dichloro-6-methyl-, 915[2].
$C_7H_4Cl_2N_2O_4$ Toluene, 3,5-dichloro-2,4-dinitro-, 1222[9].
$C_7H_4Cl_2N_2O_6$ Phenol, 3,5-dichloro-4-methoxy-2,6-dinitro-, 1394[6].
$C_7H_4Cl_2O$ Benzaldehyde, 3,4-dichloro-, 2152[4].
$C_7H_4Cl_2O_2$ Benzaldehyde, 2,4(and 2,6)-dichloro-3-hydroxy-, 1065[4].
Benzoic acid, 3,4-dichloro-, 2152[4].
Salicylaldehyde, 3,5-dichloro-, 1980[6].
$C_7H_4Cl_2O_4$ *β-Resorcylic acid, dichloro-, and salts*, *1613[1,3]*.
$C_7H_4Cl_3NO_2$ Benzaldehyde, 2,4,6-trichloro-3-hydroxy-, oxime, 1065[4].
$C_7H_4Cl_3NO_3$ Anisole, 2,4,6-trichloro-3-nitro-2317[4].
$C_7H_4HgO_2S$ Benzoic acid, *o*-mercapto-, cyclic Hg deriv., 183[7].
$C_7H_4HgO_3$ Salicylic acid, hydroxymercuri-, cyclic anhydride, 1685[2].
$C_7H_4N_2Na_2O$ 2(3)-Benzimidazolone, di-Na deriv., 381[9].
$C_7H_4N_2O_2$ Benzonitrile, *m*(*o* and *p*)-nitro-, 1216[1,2].
1,4-Imidazopyridine-2,3-dione, 2858[7].
Quinolinimide, 393[2].
$C_7H_4N_2O_3$ Salicylonitrile, nitro-, 2324[4,5]; polymer, 1230[4].
$C_7H_4N_2O_6S$ 4-Isoindazolesulfonic acid, 6,7-dihydro-6,7-diketo-, *and Na salt*, 1623[2].
$C_7H_4N_2O_9S$ Benzoic acid, dinitrosulfo-, *Na salt*, 3448[3].
$C_7H_4N_3NaO_5$ Benzaldehyde, 2,4-dinitro-, oxime, Na salt, 3450[4].
$C_7H_4N_4O_4$ Cyanamide, (2,4-dinitrophenyl)-, 173[5].
$C_7H_4N_4O_8$ Toluene, 2,3,4,6-tetranitro-, 2667[2].
$C_7H_4N_6O_6S$ Formamide, picrylazothio-, 1062[2].
$C_7H_4OS_2$ 1,3-Benzodisulfol-2-one, 3290[1].
$C_7H_4O_2S$ Pyrocatechol, thionocarbonate, 914[6].
$C_7H_4O_6$ Chelidonic acid, 1991[b].
$C_7H_4S_3$ 1,3-Benzodisulfol-2-one, 2-thio-, 3290[2].
$C_7H_5AgN_2O$ 2(3)-Benzimidazolone, Ag deriv., 381[9].
$C_7H_5AsClNO_5$ 3-Benzoxazolearsonic acid, 4-chloro-1,2-dihydro-1-keto-, P 2504[7].
$C_7H_5BrCl_2O$ Anisole, bromodichloro-, 2841[2,3].
$C_7H_5BrHgO_2$ Benzoic acid, *p*-(bromomercuri)-, *Na salt*, 1063[3].
$C_7H_5BrI_2O$ Anisole, 4-bromo-2,6-diiodo-, 2841[3].
$C_7H_5BrN_2O$ 1,4-Imidazopyridin-2(3)-one, 3-bromo, *-HBr*, 2858[8].
$C_7H_5BrN_4O_3$ Benzazimidol, 5-bromo-7-methyl-6-nitro, 1223[1].
$C_7H_5BrO_2$ Benzoic acid, bromo-, 2354[2], 3396[2], 3712[8].
$C_7H_5BrO_4$ *β*-Resorcylic acid, 5-bromo-, 1613[3].
$C_7H_5Br_2Cl$ Toluene, dibromo-*α*-chloro-, 2485[4].
$C_7H_5Br_2ClO$ Anisole, 2,6-dibromo-4-chloro-, 1609[9].
$C_7H_5Br_2IO$ Anisole, 2,4-dibromo-6-iodo, 2841[4].
$C_7H_5Br_2NO_2$ Toluene, *α*,*α* dibromo-*m*-nitro-, 2833[7].
$C_7H_5Br_2NO_4$ Phenol, dibromomethoxynitro-, 1394[4,7].
$C_7H_5Br_2N_3O_2$ Formamide, (dibromohydroxyphenylazoxy)-, 1393[8].
$C_7H_5Br_3N_2S$ Benzothiazole, 1-amino-5 bromo, dibromide, 2858[4].
$C_7H_5Br_3O$ Anisole, tribromo-, 1394[5], 1610[4].
o-Cresol, tribromo-, 1610[2,4].
$C_7H_5Br_3O_2$ Phenol, 2,3,6-tribromo-4-methoxy-, 1394[7].
$C_7H_5ClHgO_2$ Benzoic acid, *p*-(chloromercuri)-, *and Na salt*, 1063[2,4].
$C_7H_5ClI_2O$ Anisole, 4-chloro-2,6-diiodo-, 1610[2].
$C_7H_5ClN_2O_3$ Benzaldehyde, chloronitro, oxime, 1230[4], 2321[6].
$C_7H_5ClN_2O_4$ Toluene, 4-chloro-2,3-dinitro-, 174[8].
$C_7H_5ClN_4O_4$ Formaldehyde, 5-chloro 2,4 dinitrophenylhydrazone, 750[6].
C_7H_5ClO See *Benzoyl chloride*.
C_7H_5ClOS Formic acid, chlorothiono-, Ph ester, 371[6].
$C_7H_5ClO_2$ Benzaldehyde, chlorohydroxy-, 1065[4].
Benzoic acid, chloro-, 2354[2], 2778[2], 3712[8]; *Na salt*, 2884[6].
Formic acid, chloro-, Ph ester, 371[6].
$C_7H_5ClO_3$ Benzoic acid, 5-chloro-4-hydroxy-, 3060[9].
$C_7H_5ClO_4$ *β*-Resorcylic acid, 5-chloro-, 1613[1,3].
$C_7H_5ClS_2$ Formic acid, chlorodithio-, Ph ester, 371[7].

$C_7H_5Cl_2IO$ Anisole, 2,4-dichloro-6-iodo-, 2841[4].
$C_7H_5Cl_2NO_2$ Anthranilic acid, 3,5-dichloro-, 908[5].
  Benzaldehyde, 2,4(and 2,6)-dichloro-3-hydroxy-, oxime, 1065[4].
  Benzoic acid, 4-amino-3,5-dichloro-, 908[6].
  Toluene, dichloronitro-, 1230[4], 2833[6].
$C_7H_5Cl_2N_3O$ 1,2,3-Benzotriazole, 5,6-dichloro-1-methoxy-, 750[7].
$C_7H_5Cl_3$ Toluene, α-trichloro-, P 51[3,4], 1396[4].
$C_7H_5Cl_3O_7S_3$ 1,3,5-Benzenetrisulfonyl chloride, 2-hydroxy-4-methyl-, 1395[8].
$C_7H_5FN_2O_5$ Anisole, 2-fluoro-4,6-dinitro-(?), 2840[5].
$C_7H_5HgIO_2$ Benzoic acid, *p*-(iodomercuri)-, *Na salt*, 1063[8].
$C_7H_5IN_2O_4$ Toluene, α-iodo-2,4-dinitro-, 905[2].
$C_7H_5IO_2$ Benzoic acid, iodo-, 2354[2].
  p-Toluquinone, 5-iodo-, 3449[4].
$C_7H_5IO_3$ Salicylic acid, iodo-, 91[5].
$C_7H_5IO_4$ Benzoic acid, *o*-iodoxy-, 3043[4].
$C_7H_5I_3O$ Anisole, 2,4,6-triiodo-, 1610[2].
$C_7H_5KO_6W$ Potassium monosalicylatotungstate, 3405[9].
$C_7H_5LiO_2$ + $2H_2O$ Salicylaldehyde, Li deriv., 741[3].
$C_7H_5MoO_6Tl$ + H_2O, 3656[9].
C_7H_5N Benzene, isocyano-, 593[7], 1070[9], 3165[9].
  Benzonitrile, 371[8], 2322[5].
C_7H_5NO (See also *Anthranil.*)
  Isocyanic acid, Ph ester, 901[2], 915[7], 3448[4].
  Salicylonitrile, 1216[6].
$C_7H_5NOS_2$ 1,3-Benzodisulfol-2-one, oxime, 3290[1].
$C_7H_5NO_2$ Benzoic acid, *o*-nitro-, 3396[2].
$C_7H_5NO_3$ (See also *Benzaldehyde, nitro-.*)
  Benzoic acid, *o*-nitroso-, 547[2].
$C_7H_5NO_3S$ See *Saccharin.*
$C_7H_5NO_4$ Benzoic acid, nitro, 181[9], 182[1], 689[2], 750[3], 1164[7], 2778[2].
  Quinolinic acid, 393[2].
$C_7H_5NO_5$ Chelidamic acid, 1991[5]
C_7H_5NS Benzisothiazole, *and $AgNO_3$ compd.*, 763[4].
  Isothiocyanic acid, Ph ester, 1081[5], 1223[2], 3288[2].
$C_7H_5NS_2$ Benzothiazole, 1-mercapto-, 1408[3].
$C_7H_5N_2NaO$ 2(3)-Benzimidazolone, mono-Na deriv., 381[9].
$C_7H_5N_2NaO_3$ Benzaldehyde, nitro-, oxime, *Na salt*, 3450[4].
$C_7H_5N_3O$ Benzoyl azide, 3448[4].
$C_7H_5N_3O_2$ Compd., m. 85–5.5°, from the phenylhydrazone of nitrophenylazoformaldehyde, 1223[7].
$C_7H_5N_3O_5$ Benzaldehyde, 2,4-dinitro-, oxime, 3450[4].
  Toluene, 3,5-dinitro-2-nitroso-, 2667[1].
$C_7H_5N_3O_6$ (See also *Toluene, trinitro-.*)
  Anisole, 2,4-dinitro-5-nitroso-, 2667[5].
$C_7H_5N_3O_7$ Anisole, 2,4,6-trinitro-, 177[5].
$C_7H_5N_3O_8$ Guaiacol, 4,5,6-trinitro-, 1394[9].
  Picric acid, methoxy-, 1394[8], 1395[5].
$C_7H_5N_5O_7$ Urea, picryl-, 1062[1].
$C_7H_5N_5O_8$ Tetryl, 2074[6], 2412[4].
$C_7H_5NaO_2$ See *Sodium benzoate.*
$C_7H_5NaO_3$ See *Sodium salicylate.*
$C_7H_5NaO_6W$ Sodium monosalicylatotungstate, 3405[9].
$C_7H_6AsNO_5$ 3-Benzoxazolinearsonic acid, 1,2-dihydro-1-keto-, P 2504[9].
C_7H_6BrCl Toluene, α-bromo-*m*(and *o*)-chloro-, 1066[1].
C_7H_6BrClO Anisole, 3-bromo-5-chloro-, 3449[1].
$C_7H_6BrCl_3OTe$ 5(or 6)-Bromo-*o*(or *p*)-anisyltellurium trichloride, 2670[2].
C_7H_6BrF Toluene, α-bromo-*m*(*o* and *p*)-fluoro-, 1066[1].
$C_7H_6BrHgNO_2$ Toluene, 4-(bromomercuri)-2-nitro-, 1794[1].
C_7H_6BrI Toluene, *m*(*o* and *p*)-bromo-α-iodo-, 1066[1].
C_7H_6BrNO Benzaldehyde, *o*-bromo-, oxime, *and -HCl*, 179[7].
$C_7H_6BrNO_2$ Cresol, bromonitroso-, 3449[2,3].
$C_7H_6BrNO_3$ Anisole, 3-bromo-2-nitro-, 1064[3].
  2-Pyrrolecarboxylic acid, 4-bromo-5-formyl-3-methyl-, 2160[3].
$C_7H_6Br_2$ Toluene, dibromo-, 1066[1].
$C_7H_6Br_4$ Bromination product, m. 273.5°, from Persian petroleum, 3559[6].
$C_7H_6Br_4OTe$ 5(or 6)-Bromo-*o*(or *p*)-anisyltellurium tribromide, 2670[2].
$C_7H_6ClHgNO_2$ Toluene, (chloromercuri)nitro-, 1794[1,2].
C_7H_6ClIO Anisole, 3-chloro-5-iodo-, 3449[1].
C_7H_6ClNO Benzaldehyde, *o*-chloro-, oxime, *-HCl*, 179[7].
$C_7H_6ClNO_2$ Benzaldehyde, chlorohydroxy-, oxime, 1065[3,4].
  Cresol, chloronitroso-, 3449[1].
  Picolinic acid, chloro-, Me ester, 3294[4].
  Toluene, chloronitro-, 174[6], 388[9], 2833[9].
  p-Toluquinone, 5-chloro-, 4-oxime, 3449[4].
$C_7H_6ClNO_3$ Anisole, 4-chloro-2-nitro-, 2319[7].
$C_7H_6Cl_2$ Toluene, 3,4-dichloro-, 2152[4].
$C_7H_6Cl_2N_2O_2$ *m*-Toluidine, 2,4-dichloro-6-nitro-, 2834[1].
$C_7H_6Cl_2O$ Benzyl alcohol, 3,4-dichloro-, 2152[5].
$C_7H_6Cl_2O_3S$ Benzenesulfonyl chloride, 5-chloro-2-methoxy-, 398[7].
$C_7H_6Cl_2O_4S_2$ Benzenedisulfonyl chloride, methyl-, 3586[8].
$C_7H_6Cl_2O_5S_2$ *m*-Benzenedisulfonyl chloride, 4-hydroxy-5-methyl-, 1395[6].
$C_7H_6FNO_3$ Anisole, 2-fluoro-4(and 6)-nitro-, 2840[6].
$C_7H_6HgINO_2$ Toluene, 4-(iodomercuri)-2-nitro-, 1794[1].
$C_7H_6HgO_3$ Benzoic acid, *p*-(hydroxymercuri)-, *Na salt*, 1063[2].
$C_7H_6HgO_3S$ *p*-Toluenesulfonic acid, 3-(hydroxymercuri)-, cyclic anhydride, 1225[3].
$C_7H_6INO_2$ Cresol, iodonitroso-, 3449[3,4].
  Toluene, α-iodo-3-nitro-, 905[2].
  p-Toluquinone, 5-iodo-, 4-oxime, 3449[4].
$C_7H_6INO_3$ Anisole, 3-iodo-5-nitro-, 3448[9].
$C_7H_6I_2O$ Anisole, 3,5-diiodo-, 3449[1].
$C_7H_6KNO_3$ *o*-Cresol, 6-nitro, K deriv., 741[4].
$C_7H_6LiNO_3$ *o*-Cresol, 6-nitro-, Li deriv., 741[4].
C_7H_6NNaO Benzaldehyde, oxime, Na salt, 3450[4].
$C_7H_6NNaO_3$ Benzoic acid, 3-amino-4-hydroxy-, Na deriv., 2993[8].
  o-Cresol, 6-nitro-, Na deriv., 741[4].
$C_7H_6N_2$ 1,4-Imidazopyridine, *and chloroplatinate*, 393[5,7].
$C_7H_6N_2O$ 2(3)-Benzimidazolone, 381[9].
$C_7H_6N_2O_3$ Benzaldehyde, nitro-, oxime, 3450[4].
$C_7H_6N_2O_4$ (See also *Toluene, dinitro-.*)
  Anthranilic acid, 4-nitro-, 2855[1].
  Pyrimidineacrylic acid, tetrahydrodiketo-, 3169[3].
  Salicylaldehyde, 5-nitro-, oxime, 1230[5].
$C_7H_6N_2O_5$ Anisole, 2,4-dinitro-, 2319[7].
  Cresol, dinitro-, 3769[6].
$C_7H_6N_2O_5S$ 4-Isoindazolesulfonic acid, 6,7-dihydroxy-, 1623[2].

$C_7H_6N_2O_6$ 4-Homopyrocatechol, 3,5-dinitro-, 3449^{6}.
$C_7H_6N_2S$ Aniline, *p*-thiocyano-, 1603^{7}.
Benzisothiazole, amino-, 763^{6}; *and -HCl*, 2858^{3}.
$C_7H_6N_2Se$ Phenol, *p*-amino-, selenocyanate, 3288^{4}.
$C_7H_6N_4O$ 1,2,3-Benzotriaz-4(3)-one, 3-amino-, 207^{1}.
$C_7H_6N_4O_7$ Hydroxylamine, β-(2,4,6-trinitro-*m*-tolyl)-, 2666^{7}.
$C_7H_6N_6O_6S$ Semicarbazide, 1-picrylthio-, 1062^{2}.
$C_7H_6N_6O_7$ Semicarbazide, 1-picryl-, 173^{6}.
C_7H_6O (See also *Benzaldehyde.*)
p-Benzoisopyrazolone, 1066^{5}.
$C_7H_6O_2$ (See also *Benzoic acid; Salicylaldehyde.*)
Benzaldehyde, hydroxy-, 693^{9}, 708^{4}, 1985^{9}.
2-Furanacrolein, 1235^{6}.
$C_7H_6O_2S$ Benzoic acid, *o*-mercapto-, 1396^{9}.
$C_7H_6O_3$ See *Benzoic acid, hydroxy-; Perbenzoic acid; Protocatechualdehyde; Salicylic acid.*
$C_7H_6O_3S$ Salicylic acid, 5-mercapto-, 182^{6}.
$C_7H_6O_4$ Benzaldehyde, 2,3,4-trihydroxy-, 1987^{4}.
Gentisic acid, 1613^{2}.
Pyrocatechuic acid, 908^{2}, 1613^{2}.
Resorcylic acid, 1613^{2}.
$C_7H_6O_5$ Gallic acid, 1396^{8}, 1987^{3}.
$C_7H_6O_5S$ Benzoic acid, sulfo-, 3712^{6}.
$C_7H_6O_6S$ (See also *Salicylic acid, sulfo-.*)
m-Carboxyphenylsulfuric acid, *K salt*, 1796^{4}.
C_7H_7AsBrI Arsine, (*p*-bromophenyl)iodomethyl-, 393^{4}.
C_7H_7Br Toluene, bromo-, 173^{8}, 2555^{2}, 3287^{9}, 3396^{1}.
$C_7H_7BrN_4O_2$ Theophylline, bromo-, 587^{6}.
C_7H_7BrO Anisole, *p*-bromo-, 2670^{2}.
Cresol, bromo-, 3449^{2,3}.
$C_7H_7Br_2Hg_2N$ *o*-Toluidine, ?,?-bis(bromomercuri)-, 2318^{1}.
$C_7H_7Br_2N$ *m*-Toluidine, 2,4(and 4,6)-dibromo-, 906^{2}.
$C_7H_7Br_2NO$ Benzamide, bromine addn. compd., 3377^{4}.
$C_7H_7Br_3OTe$ *p*-Anisyltellurium tribromide, 2670^{1}.
C_7H_7Cl See *Toluene, chloro-.*
C_7H_7ClHg Toluene, *p*-(chloromercuri)-, 176^{9}.
C_7H_7ClMg Benzylmagnesium chloride, 1804^{1}.
$C_7H_7ClNNaO_2S$ See *Chloramine-T.*
$C_7H_7ClN_2O$ Benzaldehyde, 5-amino-2-chloro-, oxime, 1065^{4}.
Benzoic acid, *o*-chloro-, hydrazide, 2672^{2}.
$C_7H_7ClN_2O_2$ Toluidine, chloronitro-, 174^{3}.
$C_7H_7ClN_4O_2$ Xanthine, 8-chloro-3-ethyl-, 901^{9}.
$C_7H_7ClN_4O_3$ Isouric acid, 5-chloro-3-ethyl-, 901^{7}.
C_7H_7ClO Benzyl alcohol, *o*-chloro-, 2996^{2}.
m-Cresol, chloro-, 2152^{8}, 2842^{1,2}, 3449^{3}.
C_7H_7ClOS *o*-Anisyl mercaptan, 5-chloro-, 398^{7}.
$C_7H_7ClO_2S$ *p*-Toluenesulfonyl chloride, 1795^{4}, 3586^{8}.
$C_7H_7ClO_3$ Succinic anhydride, α(α-chloroethylidene)-β-methyl-, 2824^{4}.
$C_7H_7ClO_3S$ Benzenesulfinic acid, 5-chloro-2-methoxy-, 398^{7}.
$C_7H_7ClO_4S$ Benzenesulfonic acid, 5-chloro-2-methoxy-, 398^{8}.
$C_7H_7Cl_2Hg_2N$ *o*-Toluidine, ?,?-bis(chloromercuri)-, 2318^{1}.
$C_7H_7Cl_2N$ *o*-Toluidine, ?,?-dichloro-, 2318^{1}.
$C_7H_7Cl_2O_2P$ Dichloro-*p*-toloxyphosphonium oxide, 913^{8}.
$C_7H_7Cl_3OTe$ *p*-Anisyltellurium trichloride, 2669^{9}.
$C_7H_7Cl_3O_2Te$ 3-Hydroxy-*p*-anisyltellurium trichloride, 907^{6}.
C_7H_7FO Anisole, *o*-fluoro-, 2840^{6}.
$C_7H_7IKNO_2S$ *p*-Toluenesulfonamide, *N*-iodo-, *N*-K deriv., 1612^{5}.
C_7H_7IO Cresol, iodo-, 401^{1}, 3449^{8}.
C_7H_7NO Anthranilaldehyde, 3745^{4}.
Benzaldehyde, *m*-amino-, 1216^{1}.
—, oxime, 3450^{4}.
Benzamide, 693^{9}, 2491^{7}, 3377^{4}.
$C_7H_7NO_2$ (See also *Anthranilic acid; Benzoic acid, amino-; Toluene, nitro-; Trigonelline.*)
Benzyl nitrite, 2976^{6}.
2-Furanacrolein, oxime, 1235^{8}.
2-Pyridol, acetate, 1413^{1}.
Salicylamide, 2673^{9}.
$C_7H_7NO_3$ Anisole, nitro-, 1021^{2}, P 1631^{4}.
Benzoic acid, 3-amino-4-hydroxy-, *and -HCl*, 2993^{8}.
Benzyl alcohol, *o*-nitro-, 2996^{2}.
3-Pyrrolecarboxylic acid, 5-formyl-4-methyl-, 3455^{4}
$C_7H_7NO_3S$ Guaiacol, 4-nitrothio-, 3290^{4}.
2-Thiophenecarboxylic acid, 4-acetamido-, 2854^{9}.
$C_7H_7NO_4$ Gallamide, 1987^{3}.
2,3-Pyrroledicarboxylic acid, 4-methyl-, 3455^{7}.
$C_7H_7NO_4S$ *m*-Toluenesulfinic acid, 4-nitro-, *and ferric salt*, 1794^{2}.
$C_7H_7NO_5S$ Anthranilic acid, 4(and 5)-sulfo-, 403^{7}.
Benzenesulfinic acid, 2-methoxy-5(and 4)-nitro-, 3290^{8}.
p-Toluenesulfonic acid, 3-nitro-, *salts*, 2838^{5}.
$C_7H_7N_3O$ 1,2,4-Benzotriaz-3(2)-one, 1,4-dihydro-, 745^{8}.
Formaldehyde, nitrosophenylhydrazone, 722^{5}.
6-Isoindazolol, 7-amino-, *and hydrochlorides*, H_{10}, 1623^{2}.
$C_7H_7N_3O_2$ Benzamidine, *m*-nitro-, *-HCl*, 2326^{9}.
Formamide, (*p*-hydroxyphenylazo)-, 1393^{4}.
Pyrrolo[2,3-δ]pyridazin-4,7-dione, 5,6-dihydro-3-methyl-, 3455^{8}.
Quinone, semicarbazone, 1393^{4}.
$C_7H_7N_3O_2S$ Toluenesulfonyl azide, 1408^{8}, 1409^{2}.
$C_7H_7N_3O_3$ Formamide, (hydroxyphenylazoxy)-, 1393^{7}.
Pyridine, 2-acetamidonitro, 764^{3}, 2490^{8}.
$C_7H_7N_3O_4$ Dipicolinic acid, 4-hydrazino-, *and derivs.*, 1807^{3}.
o-Toluidine, 4,6-dinitro-, 2666^{7}.
$C_7H_7N_3O_5$ Hydroxylamine, β-(dinitrotolyl)-, 2668^{6,7}.
$C_7H_7N_3O_6$ Hydroxylamine, β-(4,6-dinitroanisyl)-, 2666^{9}; *and addn. compds.*, 2667^{4,5}.
$C_7H_7N_3S$ 1,2,4-Benzotriazine-3-mercaptan, 1,2-dihydro-, 745^{7}.
$C_7H_7N_5$ 1,2,3,5-Tetrazole, 4-amino-1-phenyl-, *and $AgNO_3$ compd.*, 763^{9}, 764^{1}.
$C_7H_7N_5O_4S$ Semicarbazide, 1-(2,4-dinitrophenyl)thio-, 1062^{1}.
C_7H_7NaO Sodium benzyloxide, 2671^{4}.
Sodium cresoxide, 2840^{6}.
C_7H_7OTl *m*-Cresol, Tl deriv., 49^{7}.
$C_7H_7O_2Tl$ Guaiacol, Tl deriv., 49^{7}.
Phenol, *m*-methoxy-, Tl deriv., 49^{7}.
C_7H_8 See *Toluene.*
$C_7H_8AsNO_5$ *m*-Arsanilic acid, *N*-formyl-4-hydroxy-, *and Na salt*, 1984^{9}.
C_7H_8BrN *p*-Toluidine, 2-bromo-, 3287^{9}.

C_7H_8BrNO *m*-Anisidine, 5-bromo-, 3449[1].
2-Pyrrolealdehyde, 4-bromo-3,5-dimethyl-, 2160[1].
$C_7H_8Br_2O_4$ 1,2-Cyclopentanedicarboxylic acid, 2,3-dibromo-, 2830[8].
$C_7H_8Br_4N$ Pyridine, -HBr, $C_2H_2Br_4$ addn. compd., 1086[5].
C_7H_8ClNO Anisidine, chloro-, 2319[7], 3449[1], 3694[5]; *and -HCl*, 1796[5].
o-Cresol, 4-amino-5-chloro-, 3449[3].
$C_7H_8ClNO_3S$ Benzenesulfonamide, 5-chloro-2-methoxy-, 398[7].
$C_7H_8HgO_4S$ *p*-Toluenesulfonic acid, 3-(hydroxymercuri)-, 1225[3].
C_7H_8INO *m*-Anisidine, 5-iodo-, 3449[1].
Cresol, aminoiodo-, 3449[3,4].
$C_7H_8INO_2$ 3-Pyrrolecarboxylic acid, 4-iodo-2,5-dimethyl-, 597[2].
$C_7H_8I_2N_2Pb$, 3657[2].
$C_7H_8N_2$ Benzamidine, *and -HNO₃*, 2326[9].
$C_7H_8N_2O$ Benzaldehyde, *m*-amino-, oxime, 1216[1].
Pyridine, 2-acetamido-, 1926[2].
Urea, phenyl-, 174[5].
$C_7H_8N_2O_2$ Benzoic acid, *p*-hydrazino-, 1837[9].
Phenol, *o*-(methylnitrosoamino)-, 1079[9].
p-Toluidine, nitro-, 186[3].
$C_7H_8N_2O_3$ *o*-Anisidine, nitro-, 2840[2].
Nicotinamide, 2,4-dihydroxy-6-methyl, 915[1].
$C_7H_8N_4$ Isoindazole, 6,7-diamino-, *and -HCl*, 1623[3].
$C_7H_8N_4O_2$ (See also *Euphyllin; Theobromine; Theophylline.*)
Xanthine, 3-ethyl-, 901[9].
$C_7H_8N_4O_2S$ Uric acid, 3 ethyl-8 thio-, 902[1].
$C_7H_8N_4O_3$ Benzoic acid, 5-amino-2-nitro-, hydrazide, 2672[4].
Semicarbazide, 4-(*m*-nitrophenyl)-, *and -HCl*, 175[3,4].
Uric acid, 3-ethyl, 901[9].
$C_7H_8N_4O_4$ 5-*m*-Tolylenediamine, 2,4-dinitro, 1222[9].
$C_7H_8N_6O_3$ Benzazimidol, 6-hydrazino-4-methyl-7-nitro-, *N_2H_4 salt*, 1222[9].
$C_7H_8N_6O_7$ Guanidine, picrate, 112[9].
C_7H_8O See *Anisole; Benzyl alcohol; Cresol.*
C_7H_8OS Benzenesulfenic acid, Me ester, 3694[1].
1,4-Pyrone, 2,6-dimethyl-4-thio-, *$HgBr_2$ addn. compd.*, 365[3].
$C_7H_8O_2$ (See also *Guaiacol.*)
Benzyl alcohol, hydroxy-, 3315[4].
Orcinol, 908[9].
Phenol, methoxy-, 1394[7], 2325[9].
$C_7H_8O_2S$ *p*-Toluenesulfinic acid, *Na salt*, 177[5].
$C_7H_8O_3S$ Toluenesulfonic acid, 1225[3], 1301[4], 3586[8].
$C_7H_8O_4$ Δ^3-1,2-Cyclopentenedicarboxylic acid, 2830[8].
Fumaric acid, α-(α-hydroxyethyl)-β-methyl-, γ-lactone, 2824[3].
Succinic acid, α-(α-hydroxyethylidene)-β-methyl-, γ-lactone, *and NH_3 addn. compd.*, 2824[3].
$C_7H_8O_4S$ Tolylsulfuric acid, *K salt*, 1796[3].
$C_7H_8O_6$ 1,2,3-Cyclobutanetricarboxylic acid, 49[2].
$C_7H_8O_7$ Anhydromethylenecitric acid, *salts*, 1685[4].
$C_7H_8O_{10}S_3$ 1,3,5-Benzenetrisulfonic acid, 2-hydroxy-4-methyl-, *Pb salt*, 1395[8].
C_7H_8S *p*-Tolyl mercaptan, 2976[8].
$C_7H_8S_3$ Trithiodiacetylacetone cyclodisulfide (?) 199[9].
$C_7H_9BrN_2O_2$ Pyrazolecarboxylic acid, 4-bromo-1-ethylmethyl-, *and -HBr*, 2494[3,5].
—, 4-bromo-1,5-dimethyl-, Me ester, 2494[6].
$C_7H_9BrO_2$ Δ^2-Cyclopentenone, 2-bromo-3-hydroxy-4,4-dimethyl-, 3693[5].
$C_7H_9BrO_4$ 1,2-Cyclopropanedicarboxylic acid, 1-bromo-, di-Me ester, 49[1].
$C_7H_9ClN_2$ 2-*p*-Tolylenediamine, 5-chloro-, 174[3].
$C_7H_9ClN_2O$ 4-Pyrazolecarboxylyl chloride, 1,3,5-trimethyl-, 2856[9].
$C_7H_9ClO_4$ Succinic acid, α-(α-chloroethylidene)-β-methyl-, *and NH_3 addn. compd.*, 2824[4].
$C_7H_9Hg_2NO_2$ *o*-Toluidine, ?,?-bis(hydroxymercuri)-, 2318[1].
$C_7H_9LiO_4$ Salicylaldehyde, Li deriv., dihydrate, 741[3].
$C_7H_9MoNO_6$ + H_2O, 3656[3].
C_7H_9N (See also *Aniline, N-methyl-; Benzylamine; Toluidine.*)
2,5-Lutidine, *chloroplatinate*, 2501[1].
C_7H_9NO Cyclohexanone, 2-cyano-, P 2167[8].
Ketone, methyl 3-methyl-2-pyrryl, 3455[5].
$C_7H_9NO_2$ Pyrocatechol, 4-amino-, 405[1].
$C_7H_9NO_2S$ Aniline, *m*-(methylsulfonyl)-, *-HCl*, 1063[1].
$C_7H_9NO_4$ Succinimide, *N*-(hydroxymethyl)-, acetate, 365[7].
$C_7H_9N_3O$ Pyridine, 2-acetamido-5-amino-, 764[3].
Semicarbazide, 4-phenyl-, 3287[9].
$C_7H_9N_3O_3$ *o*-Phenylenediamine, 4-methoxy-5-nitro-, 2667[5].
5-Pyrimidinecarboxylic acid, 2-amino-1,4-dihydro-4-keto-, Et ester, 206[6].
2,3-Pyrroledicarboxylic acid, 4-methyl-, 3-hydrazide, 3455[6].
$C_7H_9N_3O_4$ Benzoic acid, nitro-, N_2H_4 salt, 750[3].
$C_7H_9N_3O_5$ Δ^2-1-Pyrazolinecarboxylic acid, 5-keto-3-methyl-4-nitro-, Et ester, 1990[7].
$C_7H_9O_4P$ Benzyl alcohol, phosphate, *Ba salt*, 1588[9].
$C_7H_{10}AgN_3O_2$ Δ^2-1-Pyrazolinecarboxamide, 4-ethyl-2-keto-3-methyl-, Ag deriv., 1990[7].
$C_7H_{10}AsNO_3$ Arsanilic acid, *N*-methyl-, 2838[5].
$C_7H_{10}Br_2O_4$ Glutaric acid, α,γ-dibromo-, di-Me ester, 48[8].
$C_7H_{10}ClNO_4$ Valeric acid, δ-chloro-γ,δ-diketo-, δ-oxime, Et ester, 360[3].
$C_7H_{10}Cl_2O_2$ Adipyl chloride, β-methyl-, 2990[1].
Malonyl chloride, diethyl-, 1226[3].
$C_7H_{10}Cl_2O_2Te$ 1,2-Telluropyran-3,5(4,6)-dione, 4-ethyl-, 1,1-dichloride, 193[1].
$C_7H_{10}IN$ 1-Ethylpyridinium iodide, 3008[9].
1-Methyl-2-picolinium iodide, 1627[8].
$C_7H_{10}I_2O_4$ Glutaric acid, α,γ-diiodo-, di-Me ester, 48[8].
$C_7H_{10}N_2$ Adiponitrile, β-methyl-, 2990[3].
Cyanamide, diallyl-, 169[2].
Hydrazine, benzyl-, 3006[1].
Pyridine, 4-dimethylamino-, *and salts*, 1238[7].
Tolylenediamine, P 210[6], 2301[5], 2961[2].
$C_7H_{10}N_2O_2$ Pyrazolecarboxylic acid, dimethyl-Me ester, 2494[6].
—, 1-ethylmethyl-, 2494[2].
—, 1,3,5-trimethyl-, 2856[9].
$C_7H_{10}N_2O_2S$ 2-Oxazolidone, 3-(allylthiocarbamyl)-, 2161[2].
4(1)-Pyrimidone, 5-(hydroxymethyl)-6-methyl-2-(methylmercapto)-, 2682[1].

$C_7H_{10}N_2O_3$ Δ^2 - 1 - Pyrazolinecarboxylic acid, 5-keto-3-methyl-, Et ester, 1990[8].
$C_7H_{10}N_2O_3S$ Toluenesulfonic acid, diamino-, *Na salt*, 3448[3].
$C_7H_{10}N_2O_4S_2$ *m*-Benzenedisulfonamide, 4-methyl-, 3450[5].
$C_7H_{10}N_4O$ Desoxytheobromine, 2827[3].
$C_7H_{10}N_6O_4$ Hydrazine, (2,4-dinitro-5-*m*-tolylene)bis-, 1222[9].
$C_7H_{10}O$ Δ^2-Cyclohexenone, methyl-, 744[8], 2150[1].
$C_7H_{10}O_2$ Cyclopenteneacetic acid, 3160[9].
Δ^2 - Cyclopentenone, 2-methoxy-3-methyl-, 2484[9].
2-Pentin-1-ol, acetate, 2979[9].
$C_7H_{10}O_2Te$ 1,2 - Telluropyran - 3,5(4,6) - dione, 4,4-dimethyl-, 1301[6].
—, ethyl-, 192[9], 2315[7].
$C_7H_{10}O_4$ Glutaconic acid, di-Me ester, 49[3].
α-Pentenic acid, *α*-hydroxy-*γ*-keto-, Et ester, 3006[2].
Valeric acid, *α*,*γ*-diketo-, Et ester, 2483[5], 3284[2].
$C_7H_{10}O_5$ 1,2 - Cyclopentanedicarboxylic acid, 1-hydroxy-, *and di-Ag salt*, 2830[8].
Glutaric acid, *α*-keto-*β*,*β*-dimethyl-, 3155[1].
Mesoxalic acid, di-Et ester, 50[5].
$C_7H_{10}O_5S_2$ Succinic acid, dithiocarbethoxyoxy-, *and Ba salt*, 372[8,9].
$C_7H_{10}O_6$ Glutaric acid, *β*-(carboxymethyl), 49[8].
$C_7H_{10}S$ Thiophene, 2 isopropyl-, 3005[7].
—, 2-propyl-, 3005[7].
$C_7H_{11}Br$ 1-Heptine, 1-bromo-, 1783[1].
$C_7H_{11}BrO_2$ Δ^2-1-Butenol, 3-bromo-2-methyl-, acetate, 38[8].
$C_7H_{11}Br_2N_3OS$ Oxazolidine, 3-(*β*,*γ*-dibromopropyl)thiocarbamyl-, 2161[2].
$C_7H_{11}ClO$ Cyclohexanone, 2-chloro-2-methyl-, 744[7].
$C_7H_{11}Cl_3O_2$ 2-Pentanol, 1-trichloro, acetate, 1218[1].
$C_7H_{11}I$ 1-Heptine, 1-iodo-, 1783[1].
$C_7H_{11}N$ Pyrrole, 2-ethyl-4-methyl-, 1236[5].
—, trimethyl-, 1236[2]; *$HgCl_2$ compd.*, 387[5].
$C_7H_{11}NO$ Δ^2-Cyclohexenone, 2-methyl-, oxime, 744[8].
$C_7H_{11}NO_2$ See *Arecoline*.
$C_7H_{11}NO_3$ Heptanetrione, monoxime, 3403[6].
Succinimide, *N*-(ethoxymethyl)-, 365[7].
$C_7H_{11}NO_5$ Glutamic acid, *N*-benzoyl-, 2983[2].
$C_7H_{11}NO_5S$ Succinic acid, (dimethylcarbamylmercapto)-, 373[1].
$C_7H_{11}NO_{17}STh_3$ + $7H_2O$, 1569[6].
$C_7H_{11}N_3$ Toluenetriamine, 3446[3].
$C_7H_{11}N_3O$ Imidazole, 2 - acetamido - 4,5 - dimethyl-, 193[9].
4 - Pyrazolecarboxamide, 1,3,5 - trimethyl-, 2857[1].
$C_7H_{11}N_3OS$ Oxazolidine, 3 - (allylthiocarbamyl)-2-imino-, 2161[2].
Δ^2 - Oxazoline, 2 - (*β* - allylthiocarbamido)-, 2161[2].
$C_7H_{11}N_3O_2$ Δ^2 - 1 - Pyrazolinecarboxamide, 4-ethyl-2-keto-3-methyl-, 1990[7].
$C_7H_{11}N_3O_4$ Hydroxonic acid, 3-methyl-, Et ester, 1387[2].
4 - Imidazolecarboxamide, 4 - ethoxytetrahydro - 2,5 - diketo - *N* - methyl-, 3691[5].
$C_7H_{11}N_3O_6$ Galacturonic acid, lactone, semicarbazone, 1059[2].
$C_7H_{11}N_3O_7$ Mannosaccharic acid, dilactone, monosemicarbazone, 1059[2].
$C_7H_{11}N_3O_7S_3$ 1,3,5 - Benzenetrisulfonamide, 2-hydroxy - 4 - methyl-, 1395[8].
$C_7H_{11}N_5O$ Pyrazolealdehyde, dimethyl-, semicarbazone, 2857[1,2].
$C_7H_{11}NaO_4$ Malonic acid, di-Et ester, Na deriv., 2320[6], 2823[8], 3446[4].
$C_7H_{11}O_6Tl_3$ Glucoside, methyl-, tri-Tl deriv., 2310[7].
C_7H_{12} Cyclohexene, methyl-, 2113[1].
Heptadiene, 2146[6], 3155[4].
$C_7H_{12}AsNO_3$ 3 - Pyrrolearsonic acid, 2,4,5-trimethyl-, 387[9].
$C_7H_{12}Br_2N_2O_2S$ 2 - Oxazolidone, 3 - (*β*,*γ* - dibromopropyl)thiocarbamyl-, 2161[2].
$C_7H_{12}Cl_2O_2$ Butyric acid, 1,3 - dichloropropyl ester, 2818[6].
$C_7H_{12}Cl_4O_2$ Methane, bis(*β*,*β*′ - dichloroisopropoxy)-, 3688[1].
$C_7H_{12}N_2$ *β* - Pentenonitrile, *α* - dimethylamino-, 1053[5].
$C_7H_{12}N_2O$ Pyrazole, 5 - ethoxy - 3,4 - dimethyl-, 2855[7].
—, 4 - ethyl - 5 - methoxy - 3 - methyl-, 2855[7]
5 - Pyrazolone, 4 - ethyl - 3,4 - dimethyl-, 1990[2].
—, 3-methyl-4-propyl-, 2855[7].
$C_7H_{12}N_2OS$ Hydantoin, 5 isobutyl-2-thio-, 3298[8].
$C_7H_{12}N_2O_2$ Alanine, *N* - (cyanomethyl), Et ester, 3283[3]
Glycine, *N* - (*α* - cyanoethyl), Et ester, 3283[3]
Hydantoin, 5-isobutyl-, 2010[9].
$C_7H_{12}N_2O_2Te$ 1,2 - Telluropyran - 3,5(4,6) dione, 2 (and 4) - ethyl-, dioxime, 2315[7].
$C_7H_{12}N_2O_4$ Glutamine, *N*-acetyl-, *and salts*, 2982[9].
$C_7H_{12}N_2O_5$ Butyric acid, *β* - (*β* - carboxyamino-*α* - hydroxyethylideneamino), 44[6].
Glycine, *N* - (*γ* - carboxyamino - *α* - hydroxybutylidene), 44[5].
$C_7H_{12}N_2O_6W$ + H_2O, 3657[1].
$C_7H_{12}N_3O_4Sb$ + H_2O Urea stibamine, 450[2], 502[1]
$C_7H_{12}N_4O$ Guanidine, *α* (2-hydroxy 3-methyl-Δ^2 - cyclopentenylideneamino)-, *-HNO_3*, 2484[9].
s - Triazole, 3 - acetamido - 5 - isopropyl, 3293[7].
$C_7H_{12}N_6$ Pyrazolealdehyde, dimethyl-, aminoguanidone, *-HNO_3*, 2857[1].
$C_7H_{12}O$ Cycloheptanone, 2151[5].
Cyclohexane, 1,2-epoxy-3-methyl, 2149[4].
Cyclohexanealdehyde, 1396[6].
Cyclohexanone, methyl-, 171[8], 744[7], 2150[1].
Cyclopenteneëthanol, 3161[1].
Δ^5 - 2 - Heptenone, 1602[5].
1 - Pentin - 3 - ol, 3,4 - dimethyl, 2481[6]
$C_7H_{12}O_2$ Anisole, 1,2 - epoxyhexahydro, *and I-KI complex salt*, 2665[2,3].
Cyclohexanecarboxylic acid, 3160[8], *salts*, 1799[1], *Tl salt*, 2818[3].
Cyclohexanone, 2 methoxy-, 2665[3].
2,4-Pentanedione, 3-ethyl-, 192[9].
$C_7H_{12}O_4$ Adipic acid, *β*-methyl-, 2989[9], 2990[6].
Malonic acid, di-Et ester, P 917[1], 1056[2], 1408[8], 3689[7].
—, mono-Bu ester, 3689[7].
Pimelic acid, 2151[5], 2937[4].
5,5′ - Spirobi[*m* - dioxane], 2108[9].
Succinic acid, mono-Pr ester, 3689[6].
$C_7H_{12}O_5$ Anhydro - *α* - methylglucoside, 1597[1]
Butyric acid, *α*(or *β*) - keto - *β*(or *α*),*γ*-dimethoxy-(?), Me ester, 3286[4].
$C_7H_{12}O_6$ Quinic acid, 929[9].

$C_7H_{12}O_6S$ Acetoacetic acid, (sulfomethyl)-, ethyl ester, *K salt*, 3157^2.
$C_7H_{12}O_7$ Glucoheptonic acid, β-lactone, 1058^9.
$C_7H_{12}O_{10}Th_2$ + $2H_2O$, 1569^6.
$C_7H_{13}Br$ Cyclohexane, bromomethyl-, 3160^1.
Heptene, bromo-, 2950^9.
$C_7H_{13}BrN_2O_2$ See *Adaline.*
$C_7H_{13}BrO$ Anisole, 2-bromohexahydro-, 2979^3.
2-Heptanone, 1-bromo-, 1783^6.
Pyran, 4-bromotetrahydro-2,6-dimethyl-, 1624^4.
$C_7H_{13}BrO_5$ Glucoside, methyl-, bromohydrin, 376^7, 1596^9.
$C_7H_{13}Cl$ 1-Heptene, 1-chloro-, 1592^8.
$C_7H_{13}ClO$ Butyryl chloride, α,α,β-trimethyl-, 2483^2.
Cyclohexanol, 2-chloro-5-methyl-, $2149^{1,8}$, 2150^4.
Ethylene oxide, α-amyl-β-chloro-, 1592^9.
Pyran, 4-chlorotetrahydro-2,6-dimethyl-, 1624^3
Valeryl chloride, α,α-dimethyl-, 2483^1.
$C_7H_{13}ClO_5$ Glucoside, α-methyl-, 6-chlorohydrin, 1596^9.
$C_7H_{13}Cl_3OTe$ α-Ethyl-β-ketoamyltellurium trichloride, 113^9
$C_7H_{13}I$ Cyclohexane, iodomethyl-, 3160^1
$C_7H_{13}IN_2$ Pyrazole, dimethyl-, ethiodide, 3006^5.
—, 1-ethyl-3(and 5)-methyl-, methiodide, 3006^5.
$C_7H_{13}IO_5$ Glucoside, methyl-, 6-iodohydrin, 742^9.
$C_7H_{13}MoN_3O_7$ Guanidine pyrogallolaquomolybdate, 557^1.
$C_7H_{13}NO_2$ (See also *Stachydrine.*)
Proline, Et ester, *and -HCl*, 1621^8.
$C_7H_{13}NO_5$ Lactic acid, butyl ester, nitrate, P 3460^7.
$C_7H_{13}NO_8$ Glucoside, methyl-, 6-nitrate, 742^9.
$C_7H_{13}NS$ Isothiocyanic acid, hexyl ester, 2835^3.
$C_7H_{13}N_3O_3$ Acetoacetic acid, α-methyl-, Me ester, semicarbazone, 1990^6.
$C_7H_{13}N_3O_4$ Glycine, *N*-(*N*-glycylalanyl)-, 2660^8.
α,γ-Guanidinedicarboxylic acid, di-Et ester, 2983^8.
$C_7H_{13}NaO_5$ Addn. compd. of NaOMe and di-Et oxalate, 737^7.
C_7H_{14} (See also *Cyclohexane, methyl-*.)
Cyclopentane, 1,3-dimethyl-, 2664^1.
—, ethyl-, 171^7.
Heptene, 1386^2, 3155^5, 3444^1.
3-Hexene, 3-methyl-, 2481^5.
$C_7H_{14}Br_2$ Heptane, dibromo-, 1386^2, 3444^1.
$C_7H_{14}Cl_2$ Heptane, 3,4-dichloro-, 1386^3.
$C_7H_{14}NNaO$ Enanthaldehyde, oxime, Na salt, 3450^1.
$C_7H_{14}N_2$ Base from spermine, 3172^8.
Butyronitrile, α-dimethylamino-α-methyl-, 1053^9.
Carbodiimide, dipropyl-, 374^1.
$C_7H_{14}N_2O_2$ Adipamide, β-methyl-, 2990^1.
$C_7H_{14}N_2O_3$ Hydantoic acid, Bu ester, 1055^2.
—, α-isobutyl-, 2010^9.
Succinamide, (ethoxymethyl)-, 2823^9.
$C_7H_{14}N_2O_5S$ *d*-Glucose, thioureide, 1595^9.
$C_7H_{14}N_2O_6$ *d*-Glucose, ureide, 1595^9, 1787^4.
$C_7H_{14}N_4O$ Glycocyamidine, 5-(δ-aminobutyl)-, *di-HCl*, 3690^7.
$C_7H_{14}N_4O_3$ Acetimidic acid, α-carbamido-*N*-(β-carbamylisopropyl)-, 44^7.
Butyrimidic acid, β-carbamido-*N*-(carbamylmethyl)-, 44^6.
$C_7H_{14}N_4S$ Acetone, thiocarbohydrazone, 1811^1.
$C_7H_{14}O$ (See also *Butyrone; Cyclohexanol, methyl-.*)
Cyclohexanecarbinol, 3159^9, 3286^9.
Enanthaldehyde, 739^8.
Ethylene oxide, α-ethyl-β-propyl-, 1386^3.
Δ^1-3-Heptenol, 2146^4.
$C_7H_{14}OS_2$ 2-Propanone, 1,3-bis(ethylmercapto)-, 737^2.
$C_7H_{14}O_2$ Acetic acid, Am ester, 1390^4, 1653^3, 1850^1, 2657^9, 2658^1, 3120^5.
—, α-methylbutyl ester, 580^2.
Acrylaldehyde, di-Et acetal, 3692^9.
Butyric acid, α-ethyl-α-methyl-, *Ag salt*, 2481^4.
—, α,α,β-trimethyl-, 2483^2.
Caproic acid, δ-methyl-, *Tl salt*, 2818^2.
Enanthaldehyde, α-hydroxy-, 1592^9.
Enanthic acid, 1051^7; *Tl salt*, 2818^1.
Ethylene oxide, α,β-dimethyl-α-propoxy-, 2665^6.
Heptanone, hydroxy-, 1593^8.
Isovaleric acid, Et ester, 2926^6.
Pentanone, 2-hydroxydimethyl-, $1593^{3,4}$, 2481^7.
Propionic acid, Bu ester, 580^2, 1551^5.
Valeric acid, α,α-dimethyl-, 2483^1.
$C_7H_{14}O_3$ Isovaleric acid, α-hydroxy-, Et ester, 1786^4.
Lactic acid, butyl esters, 3445^7.
Pyruvaldehyde, di-Et acetal, 1979^9.
Valeric acid, α-hydroxy-, Et ester, 1786^3.
$C_7H_{14}O_4$ Butyrin, mono-, 1087^2.
$C_7H_{14}O_5$ Arabinose, ethyl-, 2685^7.
Isorhamnoside, α-methyl-, 1221^6, 1597^1.
Rhamnose, monomethyl-, 2827^4.
$C_7H_{14}O_6$ Fructose, methyl-, 1388^3, $3285^{5,6}$.
Fructoside, γ-methyl-, 377^1.
Galactose, 6-Me ether, 1597^2.
Glucose, methyl-, 170^7, 2987^9.
Glucoside, methyl-, $3285^{7,9}$.
Mannoside, α-methyl-, 1060^2.
$C_7H_{14}O_7$ Galactonic acid, 6-Me ether, *and NH salt*, $1597^{3,4}$.
$C_7H_{15}Br$ Heptane, 4-bromo-, 1386^2.
$C_7H_{15}BrClNO_2$ Choline, bromide, chloroacetate, 2311^7.
$C_7H_{15}BrHg$ Heptylmercuric bromide, 362^2.
$C_7H_{15}BrO$ Ether, α-(α-bromoethyl)butyl methyl(?), 2979^4.
—, β-bromo-α-methylamyl methyl(?), 2979^4.
$C_7H_{15}Cl$ Heptane, 4-chloro-, 1386^2.
$C_7H_{15}Cl_2IS$ Bis(γ-chloropropyl)methylsulfonium iodide, *HgI₂ addn. compd.*, 362^9.
$C_7H_{15}Li$ Lithium heptyl, 3688^6.
$C_7H_{15}NO$ Acetamide, *N*-isoamyl-, 2979^6.
Butyramide, α,α,β-trimethyl-, 2483^2.
Butyrone, oxime, *ZnCl₂ deriv.*, 1784^9.
Cyclohexanol, 2-amino-4-methyl-, 2831^6.
Enanthaldehyde, oxime, 3450^4.
Valeramide, α,α-dimethyl-, 2483^1.
$C_7H_{15}NO_2$ Alanine, Bu and isobutyl esters, *-HCl*, 1055^2.
$C_7H_{15}NO_2S$ Thiomorpholine, 4-isopropyl-, 1-dioxide, *and -HCl*, 40^2.
—, 4-propyl-, 1-dioxide, *and -HCl*, 40^2.
$C_7H_{15}NO_4$ Propylamine, α-ethyl-, oxalate, 900^1.
$C_7H_{15}NO_5$ Glucosyl-3-amine, methyl-, *and -HCl*, $2662^{7,9}$.
$C_7H_{15}NS$ Thiomorpholine, 4-isopropyl-, *and -HCl*, 40^1.
—, 4-propyl-, *and -HCl*, 40^1.
$C_7H_{15}N_3O_7$ Galactonic acid, lactone, semicarbazone, 1059^3.

$C_7H_{15}PS_2$ Compd. from Et_3P and CS_2, 1926[4].
C_7H_{16} (See also *Heptane.*)
Hexane, 3-methyl-, 2480[4].
Pentane, dimethyl-, 2480[4].
$C_7H_{16}BrNO_2$ (Carboxymethyl)trimethylammonium bromide, Et ester, 3688[8].
Choline, bromide, acetate, 2311[6].
$C_7H_{16}NO_4P$ Ethanephosphonic acid, β-carbamyl-, di-Et ester, 2978[9].
$C_7H_{16}N_2$ Base from spermine, 3172[9].
$C_7H_{16}N_2S$ Pseudourea, α,β-diethyl-α,γ-dimethylthio-, 374[8].
Urea, α,β-diethyl-α,β-dimethylthio-, 374[2].
Urea, *s*-dipropylthio-, 2835[3].
$C_7H_{16}N_4O_2$ Arginine, N^{α}-methyl-, *and salts*, 3691[1].
Lysine, N^{ϵ}-guanyl-, *and salts*, 3690[6,7].
$C_7H_{16}N_4O_3$ Propionic acid, α(or β)-amino-β(or α)-(α,β-diaminopropionylamino)-, Me ester, 2983[4].
$C_7H_{16}O$ 1-Butanol, 2-ethyl-2-methyl-, 2481[4].
Heptyl alcohol, 1865[9], 3280[2].
$C_7H_{16}O_2$ Acetone, di-Et acetal, 2937[7].
3,4-Heptanediol, 1386[3].
2,3-Pentanediol, 2,4-dimethyl-, 1786[4].
$C_7H_{16}O_3$ Orthoformic acid, tri-Et ester, 41[7].
$C_7H_{16}O_4$ Glyceraldehyde, di-Et acetal, 3692[9].
$C_7H_{16}O_4S_2$ See *Sulfonal.*
$C_7H_{16}Se_2$ Propane, 2,2-bis(ethylselenyl)-, 1051[5].
$C_7H_{16}Zn$, 2468[1].
$C_7H_{17}N$ *tert*-Amylamine, *N*,*N*-dimethyl-, 1053[7].
$C_7H_{17}NO$ 2-Butanol, 3-dimethylamino-2-methyl-, *and -HCl*, 2820.
Diethylamine, *N*-(ethoxymethyl)-, 2303[4].
Ethanol, 2-isoamylamino-, 1629[4].
$C_7H_{17}NO_2$ See *Choline, acetyl-.*
$C_7H_{17}N_3$ Guanidine, α-ethyl-α,β,γ,γ-tetramethyl-, 374[8].
$C_7H_{17}O_6P$ Glycerophosphoric acid, di-Me ester, di-Me ether, 1219[1,2,6].
$C_7H_{18}INO$ Diethyl(methoxymethyl)methylammonium iodide, 2309[7].
(γ-Hydroxy-α-methylpropyl)trimethylammonium iodide, 1788[6].
$C_7H_{19}NO$ Butyltrimethylammonium hydroxide, 3747[4].
$C_7H_{22}Cl_7FeN_4$, 25[5].
$C_8H_2As_2I_2N_2O_4S_2$ Thiophene, 2,2′-arsenobis-[5-iodonitro-, 1407[3].
$C_8H_3BrO_2S_2$ 1,4-Benzodithiin-2(3)-one, 6 (or 7)-bromo-, 1797[9].
$C_8H_3NO_3$ Quinolinic anhydride, 764[7].
$C_8H_4Ag_2N_2O_2$ 2,3(1,4)-Quinoxalinedione, di-Ag deriv., 382[1].
$C_8H_4As_2Br_2S_2$ Thiophene, 2,2′-arsenobis[5-bromo-, 1407[3].
$C_8H_4As_2I_2S_2$ Thiophene, 2,2′-arsenobis[5-iodo-, 1407[3].
$C_8H_4As_2N_2O_4S_2$ Thiophene, 2,2′-arsenobis[5-nitro-, 1407[3].
$C_8H_4BrClO_2$ 2(1)-Benzofuranone, 1-bromo-4-chloro-, 3004[7].
$C_8H_4Br_2O_6$ Phthalic acid, 3,5-dibromo-4,6-dihydroxy-, *and salts*, 1613[1,3].
$C_8H_4Br_5NO$ Acetanilide, *ar*-pentabromo-, 3162[3].
$C_8H_4Cl_2O_2$ Phthalyl chloride, 1226[2].
Terephthalyl chloride, 380[6].
$C_8H_4NNaO_2$ Isatin, Na deriv., 2997[4].
$C_8H_4N_2O_4$ Isatin, 5(and 6)-nitro-, 2854[9].
$C_8H_4N_2O_5$ Isatoic anhydride, 4(and 5)-nitro-, 2855[1].
$C_8H_4N_2S$ Benzonitrile, o-thiocyano-, 2995[9].
$C_8H_4N_4OS$ 2-Benzisothiazolecarboxylyl azide, 763[5].
$C_8H_4O_3$ Phthalic anhydride, 1075[6], 3164[2], P 3171[1], P 3460[8].
$C_8H_5AgN_2O_2$ 2,4(1,3)-Quinazolinedione, mono-Ag deriv., 382[1].
$C_8H_5AsO_6$ Phthalic acid, 3-arsono-, anhydride, 3162[8].
$C_8H_5BrClNO$ Benzoxazole, 6-bromo-4-chloro-1-methyl-, 194[2].
$C_8H_5BrOS_2 + 2H_2O$ 1,4-Benzodithiin-2,3-dione, 6-bromo-, 1797[8].
$C_8H_5BrO_6$ Isophthalic acid, 5-bromo-2,4-dihydroxy-, *and salts*, 1613[1,3].
$C_8H_5Br_2N$ *o*-Tolunitrile, α,α-dibromo-, 1614[2].
$C_8H_5Br_2NO$ Benzoxazole, 4,6-dibromo-1-methyl-, 194[2].
$C_8H_5Br_2NO_3$ Acetophenone, α,2-dibromo-5-nitro-, 1230[2].
$C_8H_5ClN_2O$ 1-Phthalazinol, 4-chloro-, 185[6].
$C_8H_5ClN_4O_2$ 1,2,3,5-Tetrazole, 4-(5-chlorosalicylyl)-, 3004[7].
$C_8H_5ClO_6$ Isophthalic acid, 5-chloro-2,4-dihydroxy-, *and salts*, 1613[1,3].
$C_8H_5Cl_2N_3O_2$ Benzazimidole, 5,6-dichloro-, acetate, 750[7].
$C_8H_5Cl_3O_2$ Benzaldehyde, 2,4,6-trichloro-3-methoxy-, 1065[8].
$C_8H_5Cl_3O_3$ Benzoic acid, 2,4,6-trichloro-3-methoxy-, 1065[8].
$C_8H_5FeO_4$ Gallacetophenone, Fe deriv., 405[9].
$C_8H_5HgNO_3$ Salicylic acid, cyanomercuri-, 91[3], 1685[1].
$C_8H_5KN_2O_2$ 2,3(1,4)-Quinoxalinedione, mono-K deriv., 382[1].
C_8H_5NO Benzoyl cyanide, 1798[7], 2323[8], 3448[8].
$C_8H_5NO_2$ Isatin, 193[1], 758[5], 1804[6].
Phthalimide, 184[9], P 424[9].
$C_8H_5NO_2S$ 2-Benzisothiazolecarboxylic acid, 763[4].
1-Benzothiazolecarboxylic acid, 600[1].
$C_8H_5NO_3$ Anthroxanic acid, 179[9], 1620[8].
$C_8H_5NO_3S$ Salicylic acid, 5-thiocyano-, 1603[9].
$C_8H_5N_2NaO_2$ 2,4(1,3)-Quinazolinedione, mono-Na deriv., 382[1].
$C_8H_5N_3O_2$ 2(1)-Benzofuranone, 1-triazo-, 3004[4].
$C_8H_5N_3O_7$ Acetophenone, 2,4,6-trinitro-, 376[1].
$C_8H_5N_3S_2$ Aniline, 2,4(?)-dithiocyano-, 1603[7].
$C_8H_5N_7O$ 1,2,3,5-Tetrazole-4-carboxylyl azide, 1-phenyl-, 763[9].
C_8H_6 Benzene, ethinyl-, 173[7].
$C_8H_6As_2S_2$ Thiophene, 2,2′-arsenobis-, 1407[3].
$C_8H_6BrClO_2$ Phenol, 3-bromo-5-chloro-, acetate, 3449[1].
$C_8H_6BrClO_4$ Quinone, 2-bromo-6-chloro-3,5-dimethoxy-, 1225[7].
$C_8H_6BrIO_2$ Phenol, 3-bromo-5-iodo-, acetate, 3449[2].
C_8H_6BrN See *Tolunitrile, bromo-.*
C_8H_6BrNO Benzoxazole, 4-bromo-1-methyl-, 194[2].
$C_8H_6BrNO_3$ Acetophenone, 2-bromo-5-nitro-, 1230[2].
$C_8H_6BrNO_4$ Phenol, 3-bromo-5-nitro-, acetate, 3448[9].
$C_8H_6Br_2Cl_2O_2$ Benzene, 1,3-dibromo-4,6-dichloro-2,5-dimethoxy-, 1609[8].
$C_8H_6Br_2N_2O_6$ Benzene, 1,3-dibromo-2,5-dimethoxy-4,6-dinitro-, 1394[2].
$C_8H_6Br_2O_2$ Phenol, 3,5-dibromo-, acetate, 3449[1].

$C_8H_6Br_3NaO_3$ Phenol, 3,4,5-tribromo-2,6-dimethoxy-, Na deriv., 2320[4].
$C_8H_6Br_4O_2$ Benzene, 1,2,4,5-tetrabromo-3,6-dimethoxy-, 1394[6].
$C_8H_6ClIO_2$ Phenol, 3-chloro-5-iodo-, acetate, 3449[2].
C_8H_6ClNO Benzoxazole, 4-chloro-1-methyl-, 194[1].
$C_8H_6ClNO_2$ Glyoxal, (*p*-chlorophenyl)-, oxime, 360[4].
Glyoxylyl chloride, phenyl-, oxime, 360[4].
$C_8H_6ClNO_4$ Anisoyl chloride, 3-nitro-, 394[3].
Phenol, 3-chloro-5-nitro-, acetate, 3448[9].
$C_8H_6ClN_3O_5$ Acetanilide, 5-chloro-2,4-dinitro-, 590[8].
$C_8H_6ClN_3O_8$ Benzene, 1-chloro-3,5-dimethoxy-2,4,6-trinitro-, 1395[5], 2317[4].
$C_8H_6Cl_2N_2O_6$ Benzene, 1,3-dichloro-2,5-dimethoxy-4,6-dinitro-, 1394[6].
$C_8H_6Cl_2O_2$ Benzaldehyde, 2,4(and 2,6)-dichloro-3-methoxy-, 1065[6].
Phenol, 3,5-dichloro-, acetate, 3449[1].
$C_8H_6Cl_2O_3$ Benzoic acid, 2,6-dichloro-3-methoxy-, 1065[6].
$C_8H_6Cl_2Hg_2NO$ Acetanilide, 2-chloro-4,6-bis-(chloromercuri)-, 589[5].
C_8H_6IN Tolunitrile, α-iodo-, 905[3], 1230[7].
C_8H_6INO Oxindole, iodo-, P 2504[3].
$C_8H_6INO_4$ Phenol, 3-iodo-5-nitro-, acetate, 3449[1].
$C_8H_6NNaO_3$ Piperonal, oxime, Na salt, 3450[4].
$C_8H_6NNaO_3S_2$ *p*-Tolunitrile, α-hydroxy-, Na thiosulfate, 905[3].
$C_8H_6N_2OS$ 2-Benzisothiazolecarboxamide, 763[3].
$C_8H_6N_2O_2$ Glyoxime, phenyl-, peroxide, 1085[1].
1,2,4-Oxdiazol-5(4)-one, 3-phenyl-, 2822[9].
1,4-Phthalazinedione, 2,3-dihydro-, 184[9], 381[9].
2,4(1,3)-Quinazolinedione, 382[1].
2,3(1,4) Quinoxalinedione, 382[1].
α-Tolunitrile, nitro-, 182[3], 1216[1].
$C_8H_6N_2O_3$ Benzisoxazole, 2-methyl-4-nitro-, 1230[4].
$C_8H_6N_2O_4$ Styrene, β,2-dinitro-, 912[7].
$C_8H_6N_2S_2$ 1,4-Phthalazinedimercaptan, 185[6].
$C_8H_6N_4$ Imidazoindazole, 1,8-dihydro-, 1623[3].
$C_8H_6N_4O_2$ 1,2,3,5-Tetrazole, 4-salicylyl-, 3004[9].
$C_8H_6N_4O_4$ Cyanamide, (4,6-dinitro-*m*-tolyl)-, 173[5].
$C_8H_6N_4O_6$ Glyoxylanilide, 2,4-dinitro-, oxime, 1804[7].
$C_8H_6N_6O_8$ Semioxamazide, picryl-, 173[6].
$C_8H_6N_6O_9$ Urea, α-methyl-α-nitro-β-(2,4,6-trinitrophenyl)-, 590[4].
$C_8H_6O_2$ Phthalide, 751[2].
$C_8H_6O_3$ (See also *Piperonal.*)
Glyoxylic acid, phenyl-, 56[6]
Phthalaldehydic acid, 1613[9].
$C_8H_6O_3S$ 2(1)-Thionaphthenone, *S*-dioxide, 1069[4], 2995[3].
$C_8H_6O_4$ (See also *Phthalic acid; Terephthalic acid.*)
Piperonylic acid, 3695[4].
$C_8H_6O_6$ Isophthalic acid, 2,4-dihydroxy-, 1613[3].
Phthalic acid, 3,5-dihydroxy-, 1613[3].
Terephthalic acid, dihydroxy-, 1613[3].
$C_8H_6O_6S$ 2,3,5-Thiophenetricarboxylic acid, 4-methyl-, 387[1].
C_8H_6S Thionaphthene, 193[4], 1804[4].
$C_8H_7AsINO_3$ Acetanilide, 5-arsinoso-2-hydroxy-3-iodo-, 3289[4].
$C_8H_7AsN_2O_5$ 6-Quinoxalinearsonic acid, 2,3-dihydroxy-, 1606[1].
$C_8H_7AsO_7$ Phthalic acid, 3-arsono-, *and tri-Na salt*, 3162[8].
$C_8H_7BrCl_2O_3$ Phenol, 3-bromo-4,5-dichloro-2,6-dimethoxy-, 1225[7].
$C_8H_7BrN_2O_2$ Aniline, *N*-(β-bromo-β-nitroethylidene)-, 363[3].
$C_8H_7BrN_2O_3$ Acetophenone, 2-bromo-5-nitro-, oxime, 1230[2].
$C_8H_7BrN_2O_6$ *m*-Cresol, 5-bromo-4-methoxy-2,6-dinitro-, 1394[6].
$C_8H_7BrN_2S$ Benzothiazole, 1-amino-?-bromo-3(and 5)-methyl-, *and -HBr*, 2858[9].
$C_8H_7BrN_4O_3$ Benzaldehyde, 4-bromo-3-nitro-, semicarbazone, 2321[7].
C_8H_7BrO Acetophenone, bromo-, 180[9], 404[5], 415[8].
$C_8H_7BrO_2$ Toluic acid, α-bromo-, 378[9], 2848[3].
$C_8H_7BrO_3$ Salicylaldehyde, 3-bromo-5-methoxy-, 178[9].
$C_8H_7BrO_4$ Anisic acid, 5-bromo-2-hydroxy-, 3004[5].
Quinone, 2-bromo-3,5-dimethoxy-, 1225[7].
$C_8H_7Br_2ClO_3$ Phenol, 4,5-dibromo-3-chloro-2,6-dimethoxy-, 3694[9].
$C_8H_7Br_3O$ Anisole, 3,4,5-tribromo-2-methyl-, 1610[4].
$C_8H_7Br_3O_2$ Benzene, tribromodimethoxy-, 1394[2,3].
$C_8H_7Br_3O_3$ Phenol, 3,4,5-tribromo-2,6-dimethoxy-, 1609[7], 2320[4].
$C_8H_7ClN_2O_2$ Glyoxime, chlorophenyl-, 1084[9].
Glyoxylyl chloride, phenyl-, dioxime, 360[4].
$C_8H_7ClN_2O_6$ Benzene, 1-chloro-3,5-dimethoxy-2,4-dinitro-, 1395[4].
$C_8H_7ClN_4O_3$ Benzaldehyde, 4-chloro-3-nitro-, semicarbazone, 2321[6].
C_8H_7ClO Acetophenone, chloro-, 2552[4], 2555[3], P 3574[1].
o-Toluyl chloride, 402[1].
$C_8H_7ClO_2$ Benzaldehyde, chloromethoxy-, 1065[5].
Benzoic acid, chloromethyl ester, 3687[7].
Toluic acid, chloro-, 378[9], 2527[9], 2848[3].
Vanillin, 5-chloro-, 1980[6].
$C_8H_7ClO_3$ Benzoic acid, 3-chloro-4-hydroxy-, methyl ester, 3712[8].
—, 2-chloro-3-methoxy-, 1065[3].
$C_8H_7Cl_2HgNO_2$ Aniline, 2-(acetoxymercuri)-4,6-dichloro-, 2317[7].
$C_8H_7Cl_2N_3O$ 1,2,3-Benzotriazole, 5,6-dichloro-1-ethoxy-, 750[7].
$C_8H_7Cl_3O_3$ Phenol, 3,4,5-trichloro-2,6-dimethoxy-, 2320[4].
$C_8H_7I_2NO$ Acetanilide, 2,4-diiodo-, 2318[3].
$C_8H_7LiO_3 + 2H_2O$ Salicylic acid, Me ester, Li deriv., 741[3].
C_8H_7N (See also *Indole.*)
Tolunitrile, 181[8], 182[2], 371[8], 386[5,6].
C_8H_7NO Anisonitrile, 2322[5].
Phthalimidine, 381[7], 1926[5].
C_8H_7NOS 2(1)-Benzisothiazolone, 1-methyl-, *and -HCl*, 2327[7].
$C_8H_7NO_3$ Glyoxylohydroxamic acid, phenyl-, 1978[6].
Piperonal, oxime, 3450[4].
$C_8H_7NO_4$ Acetophenone, 2-hydroxy-3-nitro-, 1237[4].
Benzoic acid, *m*-nitro-, Me ester, 181[9].
Toluic acid, nitro-, 182[3], 2527[9].
$C_8H_7NO_5$ Benzoic acid, 5-methoxy-2-nitro-, *and Ag salt*, 1065[5].
Chelidamic acid, 1-methyl-, 1991[5].

2,4 - Pyrroledicarboxylic acid, 5-formyl-3-methyl-, 2160^4.
Salicylaldehyde, 5-methoxy-3-nitro-, 178^8.
C_8H_7NS Benzonitrile, *o* - (methylmercapto)-, 2995^2.
Thiocyanic acid, benzyl ester, 747^8.
—, tolyl ester, 2313^9.
p-Tolunitrile, α-mercapto-, 905^3.
C_8H_7NSe *p*-Cresol, selenocyanate, 3288^4.
$C_8H_7N_2NaO_6$ Isocreosol, 4,6-dinitro-, Na deriv., 3449^5.
$C_8H_7N_3$ Benzoheptatriazine, 745^8.
$C_8H_7N_3O$ 1,2,3 - Benzotriazole, 1-acetyl-, 2327^8.
$C_8H_7N_3OS$ 2 - Benzisothiazolecarboxylic acid, hydrazide, 763^6.
$C_8H_7N_3O_2$ Acetophenone, 4 - hydroxy - α - triazo-, 3004^8.
Urazole, phenyl-, 1770^7.
$C_8H_7N_3O_4$ Glyoxylanilide, *m* (and *p*) - nitro-, 2855^1.
$C_8H_7N_3O_6$ Acetanilide, 2-hydroxy-4,6 dinitro-, 2840^2.
$C_8H_7N_3O_7$ Phenetole, 2,4,6-trinitro-, 177^5.
$C_8H_7N_3O_8$ Creosol, 3,5,6-trinitro-, 908^1.
$C_8H_7N_3O_9$ Picric acid, dimethoxy-, 1395^5.
$C_8H_7N_3S_2$ Thiuret, N^3 - phenyl-, *-HCl*, 2161^5
$C_8H_7N_5O_3$ 1,2,4 - Oxdiazole, 3 (or 5) - amino-5 (or 3) - nitroanilino-, 2161^7.
$C_8H_7N_5O_7$ Urea, β (2,4-dinitrophenyl)-α-methyl-α-nitro-, 590^4.
—, α - (4,6 - dinitro - *m* - tolyl) - β - nitro-, 173^6.
$C_8H_7O_3Tl$ Vanillin, Tl deriv., 49^7.
C_8H_8 See *Styrene.*
$C_8H_8AsNO_5$ 3 - Benzoxazolearsonic acid, 1,2-dihydro - 1 - keto - 4 - methyl-, P 2A14[6]
$C_8H_8AsNO_8$ Benzenearsonic acid, 4-carboxyoxy - 3 - nitro-, Me ester, 1984^8.
$C_8H_8Ba_2Mo_4O_{22}$ Barium dimolybdomalate, 1184^9.
$C_8H_8Bi_2O_{16}S$ + $6H_2O$, 3403^8.
$C_8H_8BrNO_3$ Anisole, 4 - (bromomethyl) - 2-nitro-, 2833^8.
$C_8H_8BrN_3O$ Benzaldehyde, *p* - bromo-, semicarbazone, 2321^5
$C_8H_8Br_2$ *m*-Xylene, α,α′-dibromo-, 1794^4
$C_8H_8Br_2N_2S$ Benzothiazole, 1 - amino - 3(and 5) - methyl-, dibromides, *and -HBr*, $2858^{4,5}$.
—, 1-methylamino-, dibromide, 2858^1.
Benzothiazoline, 1 - imino - 2 - methyl, dibromide, 2857^8.
$C_8H_8Br_2OS$ Anisole, 3,5(?) - dibromo - 2 - (methylmercapto)-, 3290^8
$C_8H_8Br_2O_2$ Benzene, dibromodimethoxy-, 1394^2.
$C_8H_8Br_2O_3$ Phenol, 3,4-dibromo-2,6-dimethoxy-, 1609^7.
$C_8H_8Br_3N$ 1 - β,γ - Dibromoallylpyridinium bromide, 899^6.
$C_8H_8Br_4N_2S$ Benzothiazole, 1-amino-4-methyl, tetrabromide, 2858^5.
—, 1 - methylamino-, tetrabromide, 2857^9
$C_8H_8Ca_2Mo_4O_{22}$ Calcium dimolybdomalate, 1184^9.
$C_8H_8ClHgNO_3$ Aniline, 4 - acetoxymercuri-2-chloro-, 589^2.
C_8H_8ClNO Carbanilyl chloride, *N*-methyl-, 1798^3.
$C_8H_8ClNO_2$ Acetanilide, chlorohydroxy-, 194^1, 2498^2.
Benzaldehyde, chloromethoxy-, oxime, 1065^5.
$C_8H_8ClNO_3$ Anisole, chloromethylnitro-, 174^3, 2842^3.
Phenetole, 4-chloro-2-nitro-, 2319^7, 3694^5.
$C_8H_8ClNO_3S$ Benzenesulfonyl chloride, *p*-acetamido-, 177^4.
$C_8H_8ClN_3O$ 1,2,3 - Benzotriazole, 5 - chloro-1-ethoxy-, 750^6.
$C_8H_8ClN_3O_2$ Benzaldehyde, chlorohydroxy-, semicarbazone, $1065^{3,4}$.
$C_8H_8Cl_2O$ Anisole, 2,5 - dichloro - 3 - methyl-, 2842^3.
$C_8H_8CuN_2O_2$ Mandelamide, oxime, Cu deriv., 1055^7.
$C_8H_8Cu_2Mo_4O_{22}$ Copper dimolybdomalate, 1184^9.
$C_8H_8K_4Mo_4O_{22}$ Potassium dimolybdomalate, 1184^9
$C_8H_8Li_4Mo_4O_{22}$ Lithium dimolybdomalate, 1184^9.
$C_8H_8Mo_4Na_2O_{22}$ Compd. from di-Et malate and MoO_3, 1591^1.
$C_8H_8Mo_4Na_4O_{22}$ Sodium dimolybdomalate, 1184^8.
$C_8H_8Mo_4Ni_2O_{22}$ Nickel dimolybdomalate, 1184^9.
$C_8H_8NNaO_2$ Anisaldehyde, oxime, Na salt, 3450^4.
Benzaldehyde, methoxy-, oxime, Na salt, 3450^4
$C_8H_8N_2$ Cyanamide, methylphenyl, 390^1.
1,4 - Imidazopyridine, 2(or 3) - methyl, *chloroplatinate*, 393^7.
$C_8H_8N_2O$ Glyoxal, monophenylhydrazone, 2821^6.
$C_8H_8N_2O_2$ Ricinine, 914^9.
$C_8H_8N_2O_3$ Glyoxylohydroxamic acid, phenyl-, oxime, 1978^8, 2822^5; *and salts*, $746^{4,5}$.
p-Tolualdehyde, 3-nitro-, oxime, *and -HCl*, 179^8.
$C_8H_8N_2O_3S$ Carbamic acid, thiol-, *p*-nitrobenzyl ester, 905^2
$C_8H_8N_2O_4$ Acetanilide, 2 - hydroxynitro-, 2318^3, 2840^3.
Acetophenone, 2 - hydroxy - 5 - nitro, oxime, 1230^3
Dipicolinic acid, 4 methylamino, 396^1, 1238^5
Picolinic acid, 3 (carboxymethyl)amino-, 396^7
$C_8H_8N_2O_5$ Anisole, 3°- methyl - 2,6 - dinitro-, 3448^3.
Phenetole, 2,4-dinitro-, 2319^7.
$C_8H_8N_2O_6$ Creosol, dinitro, 907^9, 908^1, 3449^6.
Isocreosol, 4,6-dinitro, 3449^5.
$C_8H_8N_2S$ Benzothiazole, 1-aminomethyl-, $2858^{3,4,5}$.
—, 1-methylamino, 2857^9.
Benzothiazoline, 1-imino 2 methyl-, 2857^9
$C_8H_8N_4O$ 1,2,4 - Oxdiazole, 3 (or 5) - amino-5(or 3) - anilino, *and salts*, 2161^6.
$C_8H_8N_4O_3S$ Sulfanilyl azide, *N*-acetyl, 1409^8.
$C_8H_8N_4O_5$ Urea, α - (2,4 - dinitrophenyl) β methyl, 590^4.
—, (dinitro - *m* - tolyl)-, $173^{5,6}$.
$C_8H_8N_6O$ 1,2,3,5 - Tetrazole - 4 - carboxylic acid, 1 - phenyl-, hydrazide, *and -HCl*, 763^8.
C_8H_8O See *Acetophenone; Tolualdehyde.*
$C_8H_8O_2$ (See also *Anisaldehyde; Toluic acid.*)
Acetic acid, Ph ester, 408^4.
Benzaldehyde, *o*-methoxy-, 2310^7.
Δ^3 - 2 - Butenone, 4-(2-furyl)-, 412^9, 3005^1.
p-Xyloquinone, 3308^2.
$C_8H_8O_2S$ Thionaphthene, 1,2 - dihydro-, *S*-dioxide, 193^6, 905^8.

m-Toluic acid, 6-mercapto-, 199^{4}, 202^{9}, 1396^{9}, 1397^{4}.

$C_8H_8O_3$ (See also *Mandelic acid; Vanillin.*)
Anisic acid, 795^{8}, 3060^{9}.
Benzoic acid, hydroxy-, methyl ester, 3712^{8}.
1,2-Phthalandiol, 3164^{2}.
Salicylic acid, Me ester, 523^{2}, 2021^{6}.
α-Toluic acid, *m*-hydroxy-, 2527^{9}.

$C_8H_8O_3S$ Benzoic acid, *m* - methylsulfinyl-, 3448^{7}.

$C_8H_8O_4$ Homogentisic acid, 946^{1}.
Quinone, 2,5 - dihydroxy - 3,6 - dimethyl-, 2842^{7}.

$C_8H_8O_4S$ Benzoic acid, *o*-(methylsulfonyl), 2995^{3}.
2,5 - Thiophenedicarboxylic acid, 3,4 - dimethyl-, *and salts*, 386^{9}, 387^{1}.

$C_8H_8O_5$ Acetic acid, (2,3 - dihydroxyphenoxy)-, 1987^{1}.
Addn. compd., m. 98°, of oxalic acid and PhOH, 47^{1}.
Gallic acid, Me ester, 1987^{3}.

$C_8H_8O_6$ Addn. compd., m. 197°, of hydroquinol and oxalic acid, 47^{3}.

$C_8H_8O_7$ (See also *Citric acid.*)
Tartaric anhydride, diacetate, 50^{2}.

$C_8H_8O_{12}U + 2H_2O$ Uranium tartrate, 3139^{7}.

C_8H_8S Isothionaphthene, 1,2-dihydro-, $905^{8,9}$, 1804^{6}, *and $HgCl_2$ compd*, 193^{5}.

$C_8H_9AsClNO_5$ *m* - Arsanilic acid, *N* - acetyl-5-chloro 4-hydroxy-, P 2504^{6}.
—, *N* - chloroacetyl - 4 - hydroxy-, *and Na salt*, 1985^{1}

$C_8H_9AsINO_5$ *m* - Arsanilic acid, *N* - acetyl - 4 - hydroxy - 5 - iodo, 1607^{1}, 3289^{2}.

$C_8H_9AsO_6$ Benzenearsonic acid, *m*(and *p*)-carboxyoxy, Me ester, 1984^{8}

C_8H_9Br Xylene, bromo-, 1794^{4}, 2555^{3}.

C_8H_9BrO Anisole, bromovinyl-, 3164^{9}
Ether, *o*(and *p*) bromobenzyl methyl, 1063^{7}.

$C_8H_9BrO_3$ Phenol, 3 - bromo - 2,6 - dimethoxy-, 1225^{6}.

C_8H_9Cl Benzene, chloroethyl-, P 1631^{4}
Xylene, chloro-, P 1631^{4}.

C_8H_9ClO Anisole, chloromethyl-, $2842^{1,2}$.
Ether, benzyl chloromethyl, 581^{8}.
Phenetole, β-chloro, 3687^{7}.

$C_8H_9ClO_3$ Phenol, 3 - chloro - 2,6 - dimethoxy-, 3694^{9}.

$C_8H_9ClO_3S$ Anisole, 4 - chloro - 2 - (methylsulfonyl)-, 398^{7}.

$C_8H_9Cl_3OTe$ Methylanisyltellurium trichloride, $2670^{1,2}$.
p - Phenetyltellurium trichloride, 907^{1}.

$C_8H_9Cl_3O_2Te$ (2,4 - Dimethoxyphenyl)tellurium trichloride, 907^{2}.

$C_8H_9IN_2O_2$ Aniline, 4 - iodo - *N*, *N* dimethyl-2 nitro-, 3288^{2}.

C_8H_9N Pyridine, 3-isopropenyl-, 2499^{4}.

C_8H_9NO (See also *Acetanilide.*)
Acetophenone, amino, 242^{2}, 750^{1}, 1926^{2}.
—, oxime, 1615^{1}.
α-Toluamide, 2997^{5}.

C_8H_9NOS Carbamic acid, thiono-, benzyl ester, 1395^{9}.

$C_8H_9NO_2$ Acetaldehyde, hydroxy-, 2778^{2}.
Anisaldehyde, oxime, 3450^{4}.
Anthranilaldehyde, methoxy-, *and -HCl*, $402^{8,9}$.
Anthranilic acid, Me ester, *-HCl*, 403^{7}.
Benzaldehyde, methoxy-, oxime, 3450^{4}.
Benzene, ethylnitro-, P 1631^{4}.
Benzoic acid, *p*-amino-, Me ester, 2322^{7}.
Formanilide, *o* - hydroxy - *N* - methyl-, 1079^{9}.
Mandelamide, 378^{3}.
Phenol, *p*-amino-, acetate, 2841^{4}.
Piperonylamine, *-HCl*, 405^{1}.
Toluic acid, amino-, 56^{6}, 182^{3}, 2527^{9}.
Xylene, nitro-, P 1631^{4}, 2153^{4}.

$C_8H_9NO_3$ Acetophenone, α - amino - *ar* - dihydroxy-, 242^{2}.
Phenetole, nitro-, 1793^{8}.
3 - Pyrrolecarboxylic acid, 5 - acetyl - 4-methyl-, 3455^{5}.

$C_8H_9NO_3S$ Anisole, methylmercaptonitro-, $1796^{6,7}$, $3290^{4,6}$.
Benzenesulfinic acid, *p*-acetamido-, 177^{4}.

$C_8H_9NO_4$ Benzene, 1,4 - dimethoxy - 2 - nitro-, 1394^{7}.
Creosol, 6-nitro, 908^{1}.
Isocreosol, 6-nitro, 3149^{8}.

$C_8H_9NO_4S$ Anisole, 2 - (methylsulfinyl) - 5 - nitro-, 3290^{6}.
Sulfanilic acid, *N*-acetyl-, *K salt*, 1061^{5}.

$C_8H_9NO_5S$ Anisole, 2 - (methylsulfonyl) - 3-(4,5 and 6) - nitro-, 3290^{5}.

$C_8H_9N_2O_3$ Acetanilide, *o*-nitro-, P 916^{9}.

$C_8H_9N_3$ Benzimidazole, 4(and 7) - amino - 2 - methyl-, 2497^{6}.

$C_8H_9N_3O_2$ Pyruvic acid, 4 - pyridylhydrazone, 1807^{5}.

$C_8H_9N_3O_5$ Hydroxylamine, β - (4,6 - dinitro-*o*-tolyl)-α-methyl-, 2667^{1}.

$C_8H_9N_3O_6$ Hydroxylamine, β-(4,6-dinitro-*m*-anisyl) α-methyl-, 2667^{4}.

$C_8H_9N_5O_4S$ Semicarbazide, 1-(dinitro-*m*-tolyl)thio-, $3062^{2,3}$.

C_8H_{10} See *Benzene, ethyl-; Xylene.*

$C_8H_{10}AsHgNO_6$ *m*-Arsanilic acid, *N*-acetyl-4 - hydroxy - 5 - (hydroxymercuri)-, 1607^{3}; *basic Bi salt*, 796^{1}.

$C_8H_{10}AsI$ Arsine, iodomethyl - *p* - tolyl-, 363^{8}.

$C_8H_{10}AsNO_5$ (See also *Stovarsol.*)
m - Arsanilic acid, *N* - acetyl - 4 - hydroxy-, *and Na salt*, 1984^{9}.

$C_8H_{10}AsN_3O_3$ 6 - Quinoxalinearsonic acid, 3-amino-1,2-dihydro-, 1606^{1}.

$C_8H_{10}As_2$ Benzene, ethylarseno, 2994^{9}.

$C_8H_{10}As_2I_2$ Biarsine, 1 - ethyl - 1,2 - diiodo - 2 - phenyl-, 2994^{9}.

$C_8H_{10}BrN$ Aniline, *p* - bromo - *N*, *N* - dimethyl-, 174^{7}.

$C_8H_{10}BrNO_2$ Aniline, 4-bromo 2,5-dimethoxy-, 178^{9}.

$C_8H_{10}Br_5N$ 2-Picoline, -HBr, $C_2H_2Br_4$ addn. compd., 1086^{6}.

$C_8H_{10}Br_4O_2$ Compd., m. 196–7.5°, from 1,7-octadien - 4 - in - 3,6 - diol, 1978^{3}.

$C_8H_{10}ClN$ Benzylamine, (chloromethyl)-, *salts*, $3917^{,8,9}$.

$C_8H_{10}ClNO$ Anisidine, 4-chloro-6-methyl-, 207^{5}, $2842^{2,3}$.

$C_8H_{10}Hg$ 1-Butine, 1,1′-mercuribis-, 1054^{1}.

$C_8H_{10}IN$ 1 - Allylpyridinium iodide, 3008^{9}.
Aniline, *p* - iodo - *N*, *N* - dimethyl-, 3287^{9}.

$C_8H_{10}I_2OTe$ *p* - Anisylmethyltellurium diiodide, 907^{8}.

$C_8H_{10}N_2O$ (See also *Pyrodine.*)
Acetanilide, *o*-amino-, 2327^{8}.
Aniline, dimethylnitroso-, 693^{9}, 1920^{5}.
Pyridine, 2 - (acetylimino) - 1,2 - dihydro-1-methyl-, *-HI*, 3009^{3}.

$C_8H_{10}N_2O_2$ Anthranilaldehyde, 3 - methoxy-, oxime, 402^{8}.
Benzoic acid, *o* - methoxy-, hydrazide, *and -HCl*, 2672^{3}.

s-Collidine, 3-nitro-, *and salts*, 2328[9], 2329[1].
2 - Pyridinecarbamic acid, Et ester, 1926[3].
$C_8H_{10}N_2O_3$ *o*-Anisidine, methylnitro-, 2840[4]; -*HCl*, 3458[2].
o-Phenetidine, 5-nitro-, 3694[6].
2,5-Pyrazinediol, 3,6-dihydro - 3 - methyl - 6-methylene-, monoacetate, 381[6].
Vanillic acid, hydrazide, 2672[3].
$C_8H_{10}N_2O_4$ Aniline, 2,5-dimethoxy-4-nitro-, -*HCl*, 179[1].
Isocreosol, 4-amino-6-nitro-, 3449[7].
$C_8H_{10}N_2O_5S$ Benzenediazosulfonic acid, 2,5-(and 3,4) - dimethoxy-, *NH₄ salts*, 1604[5,6].
$C_8H_{10}N_2S$ Pseudourea, γ - benzylthio-, *salts*, 374[3].
Urea, thiotolyl-, 2313[9].
$C_8H_{10}N_3NaO_3S$ Sulfanilic acid, *N*-acetyl-, hydrazide, Na deriv., 1409[6].
$C_8H_{10}N_4O$ Benzaldehyde, *m*-amino-, semicarbazone, 1216[1].
$C_8H_{10}N_4O_2$ See *Caffeine*.
$C_8H_{10}N_4O_6$ 4,8-Glycolurildicarboxylic acid, di-Me ester, 2826[3].
$C_8H_{10}O$ See *Phenethyl alcohol; Phenetole*.
$C_8H_{10}OS$ Ketone, propyl 2-thienyl, 3005[5].
$C_8H_{10}OTe$ Telluride, *p*-anisyl methyl, 907[8].
$C_8H_{10}O_2$ Anisyl alcohol, 2321[3].
Benzene, dimethoxy-, 907[3], 2849[8].
2-Butanone, 4-(2-furyl)-, 412[9], 3005[1].
Creosol, 907[9].
1,2 - Ethanediol, phenyl-, P 3170[9].
Isocreosol, 3449[5].
Linderan, 2678[9].
1,7 - Octadien - 4 - in - 3,6 - diol, 1978[2].
Veratrole, 1786[2], 2670[7], 2849[8].
$C_8H_{10}O_3$ Phenol, 2,6-dimethoxy-, 3694[9].
$C_8H_{10}O_3S$ Benzenesulfonic acid, ethyl-, 690[8].
p - Toluenesulfonic acid, Me ester, 1784[1,2].
$C_8H_{10}O_4$ Cyclopentenemalonic acid, 3160[9].
Succinic acid, α - (α - hydroxyethylidene)-β - methyl-, γ - lactone, Me ester, 2824[1].
$C_8H_{10}O_4S_2$ Benzene, *o* - bis(methylsulfonyl)-, 3289[9].
$C_8H_{10}O_8$ Tartaric acid, diacetate, 50[2].
$C_8H_{10}S$ Phenyl mercaptan, *o*-ethyl-, 193[4], 1804[6].
$C_8H_{11}As$ Arsine, dimethylphenyl-, 2839[5].
$C_8H_{11}AsN_2O_4$ Benzenearsonic acid, 4 - acetamido-3-amino-, 1605[9].
$C_8H_{11}BiO_{14}$, 1571[9].
$C_8H_{11}Br$ Cyclohexane, (bromoethinyl)-, 1783[1].
$C_8H_{11}BrN_2O_2$ 3 - Pyrazolecarboxylic acid, 4-bromo - 1 - ethyl - 5 - methyl-, Me ester, 2494[2].
$C_8H_{11}BrN_4O$ 2 - Pyrrolealdehyde, 4 - bromo-3,5 - dimethyl-, semicarbazone, 2160[1].
$C_8H_{11}Br_2I$ Cyclohexane, (α,β - dibromo - β - iodovinyl)-, 1783[7].
$C_8H_{11}ClHgN_2O_3$ Barbital, (chloromercuri)-, 2719[6].
$C_8H_{11}ClN_2O_2S$ 2 - Oxazolidone, 3 - (allylthiocarbamyl) - 5 - (chloromethyl)-, 2161[4].
—, 5 - (chloromethyl) - 3 - (4,5 - dihydro-5 - methyl - 2 - thiazyl)-, 2161[4].
$C_8H_{11}ClO_5S$ 2,6 - Dimethyl - 4 - (methylmercapto)pyrylium perchlorate, 2163[1].
$C_8H_{11}ClO_6$ 4 - Methoxy - 2,6 - dimethylpyrylium perchlorate, 2163[1].
$C_8H_{11}HgN_3O_6$ Barbital, nitratomercuri-, 2719[6].
$C_8H_{11}I$ Cyclohexane, iodoethinyl-, 1783[2].
$C_8H_{11}LiO_3$ Salicylic acid, Me ester, Li deriv., dihydrate, 741[3].
$C_8H_{11}N$ (See also *Aniline, N,N-dimethyl-; Xylidine.*)
Collidine, 2328[9].
Phenethylamine, 242[2].
Pyridine, 3-isopropyl-, 2499[4].
$C_8H_{11}NO$ (See also *Ephedrine; Tyramine.*)
Anisidine, methyl-, P 423[9].
Phenetidine, 902[6], 2300[9].
$C_8H_{11}NOS$ Anisidine, methylmercapto-, *and -HCl*, 1796[7].
$C_8H_{11}NO_2$ 2 - Butanone, 4 - (2 - furyl)-, oxime, 413[1].
Creosol, α-amino-, 405[1].
Pyrrolecarboxylic acid, methyl-, Et ester, 3455[2,7].
$C_8H_{11}NO_3$ Acrylic acid, α - cyano - β - ethoxy-, Et ester, 206[4].
s - Maleimide, α - (α - methoxyethyl) - β - methyl-, 2824[2].
$C_8H_{11}NO_4$ 4 - Piperidineacetic acid, 2,6 - diketo-4-methyl-, 49[1].
$C_8H_{11}NO_4S_2$ Benzenesulfonamide, *o*-(ethylsulfonyl)-, 3289[8].
$C_8H_{11}NS$ Aniline, *m*-(ethylmercapto)-, -*HCl*, 1063[1].
$C_8H_{11}N_2NaO_3$ Barbital, Na deriv., 2719[5].
$C_8H_{11}N_2O_2P$ Diazphospholium, phenoxy - *P* - oxotetrahydro, 911[1].
$C_8H_{11}N_3$ Acetone, 4 pyridylhydrazone, 1807[4].
$C_8H_{11}N_3O$ Anthranilic acid, *N* - methyl-, hydrazide, 207[1].
$C_8H_{11}N_3O_2$ 5-Pyrimidinecarboxylic acid, 2-amino - 4 - methyl-, Et ester, 206[6].
$C_8H_{11}N_3O_3S$ Sulfanilic acid, *N*-acetyl-, hydrazide, *and derivs.*, 1409[6].
$C_8H_{11}N_3O_4$ Hydantoin, 5 - acetamido - 1 - acetyl-, 3-methyl-, 1387[1].
$C_8H_{11}N_3O_5$ Δ[2]-1-Pyrazolinecarboxylic acid, 5-keto - 3 - methyl - 4 - nitro-, Pr ester, 1990[7].
$C_8H_{11}N_3O_7$ Isocreosol, 4,6-dinitro, hydroxylamine salt, 3449[4].
$C_8H_{11}N_3S$ Semicarbazide, thio-4-*p*-tolyl-, 2161[9].
$C_8H_{12}AsN_3O_4$ Benzenearsonic acid, 3-amino-4-(carbamylmethyl)amino, 1606[1].
$C_8H_{12}B_2O_9$ Pyroboroacetate, 1052[8].
$C_8H_{12}Br_2ClN_3OS$ Oxazolidine, 5-(chloromethyl) - 3 - (β,γ - dibromopropyl)thiocarbamyl - 2 - imino-, 2161[4].
$C_8H_{12}Br_2O_4$ Suberic acid, α,ζ dibromo, 2830[9].
$C_8H_{12}Cd_3Cl_2O_{16} + 2H_2O$, 720[2].
$C_8H_{12}ClN_3OS$ Oxazolidine, 3 - (allylthiocarbamyl) - 5 - (chloromethyl) - 2 - imino, 2161[4].
Δ[2] - Oxazoline, 2 - (β - allylthiocarbamido) 5 - (chloromethyl)-, 2161[4].
$C_8H_{12}HgN_2O_4$ Barbital, (hydroxymercuri)-, 2749[6].
$C_8H_{12}IN$ 1-Propylpyridinium iodide, 3008[9].
$C_8H_{12}N_2$ Indazole, 4,5,6,7 - tetrahydro - 5-methyl, 389[3].
$C_8H_{12}N_2O_2$ Δ[1] - 1,3 - Cyclohexenedicarboxamide, 3451[7].
Hydrazine, [2,5 (and 3,4) - dimethoxyphenyl], *and -HCl*, 1604[5,6,7].
$C_8H_{12}N_2O_3$ (See also *Barbital; Novasurol.*)
Δ[2] - 1 - Pyrazolinecarboxylic acid, 5 - keto - 3,4-dimethyl-, Et ester, 1990[4].
—, 5 - keto - 3 - methyl-, Pr ester, 1990[4]
$C_8H_{12}N_2O_3S$ Barbituric acid, 5 - ethyl - 5 - β-hydroxyethyl-2-thio-, 367[9].
$C_8H_{12}N_2O_4$ Barbituric acid, 5-ethyl-5-β-hydroxy ethyl-, 367[8].
—, 5 - ethyl - 5 - (methoxymethyl)-, 581[9].
—, 5 - propoxymethyl-, 582[1].
$C_8H_{12}N_2O_4$ 4 - Imidazolecarboxylic acid, 4-

ethoxytetrahydro - 2,5 - diketo-, Et ester, 3691^{4}.

$C_8H_{12}N_2O_5S$ Hydrazinesulfonic acid, β-[2,5 (and 3,4) - dimethoxyphenyl]-, *NH_4 salts*, 1604^{6}.

$C_8H_{12}N_4O$ Desoxycaffeine, 2827^{2}.

$C_8H_{12}N_4O_5$ Uric acid, 4,5 - dihydro - 4,5 - dimethoxymethyl-, 1387^{5}.
—, 3 - ethyl - 4,5 - dihydro - 4 (or 5) - hydroxy - 5 (or 4) - methoxy-, 901^{8}.

$C_8H_{12}O$ Δ^2 - Cyclohexenol, 1,2-dimethyl-, 744^{8}.

$C_8H_{12}O_2$ Δ^2 - Cyclohexenol, acetate, 1061^{1}.

$C_8H_{12}O_2Te$ 1,2 - Telluropyran - 3,5(4,6) - dione, 4-isopropyl-, 2315^{7}.

$C_8H_{12}O_3$ Crotonic acid, α-acetyl-, Et ester, 3006^{2}.
Cyclohexanone, 2 - hydroxy-, acetate, 2665^{5}.
Cyclopentanecarboxylic acid, 3-keto-, Et ester, 2823^{8}.
Cyclopentanone, 2 - hydroxy - 3 - methyl-, acetate, 2485^{1}.

$C_8H_{12}O_4$ 1,2 - Cyclohexanedicarboxylic acid, *di-Ag salt*, 409^{6}.
Fumaric acid, di-Et ester, 1033^{2}, 2335^{8}.
1,6 - Δ^1 - Hexenedicarboxylic acid, 2831^{1}.
Malic acid, di-Et ester, 1033^{2}.

$C_8H_{12}O_5$ Glutaric acid, β - ethyl - α - keto - β-methyl-, 3155^{1}.

$C_8H_{12}O_6$ Glutaric acid, β - (carboxymethyl)-β-methyl-, 49^{1}.
2,3,4 - Pentanetriol, triformate, 2146^{9}.

$C_8H_{12}O_8Pb$ See *Lead acetates*.

$C_8H_{12}S$ Thiophene, 2 (and 3)-butyl-, $3005^{4,5,7}$.

$C_8H_{13}BrN_2O_4$ Δ^2 - Oxazoline, 2 - acetamido - 5-(bromomethyl)-, acetate, 2161^{3}.

$C_8H_{13}BrO$ Acetophenone, α - bromohexahydro-, 1783^{7}.

$C_8H_{13}BrO_2$ Cyclohexanol, 2 - bromo-, acetate, 2979^{3}.

$C_8H_{13}Br_2NO_2$ Nipecotic acid, dibromo - 1,4-dimethyl-, *-HBr*, 1810^{6}.

$C_8H_{13}ClN_2O_4$ Alanine, *N* - (*N* - chloroacetylalanyl)-, 3299^{2}.
Δ^2 - Oxazoline, 2 - acetamido - 5 - (chloromethyl)-, acetate, 2161^{3}.

$C_8H_{13}ClO_2$ Cyclohexanol, 2-chloro-, acetate, 2831^{7}.

$C_8H_{13}IN_2$ Pyridine, 1,2-dihydro-1-methyl-2-methylimino-, methiodide, 3009^{1}.

$C_8H_{13}IN_2O_2$ 3 - Pyrazolecarboxylic acid, 1,5-dimethyl-, Me ester, methiodide, 3006^{6}.

$C_8H_{13}MoN_3O_8$ + $2H_2O$ Guanidine monogallatomolybdate, 3406^{1}.

$C_8H_{13}N$ Pyrrole, ethyldimethyl-, 1236^{1}, 1621^{2}.

$C_8H_{13}NO$ 2 - Furanpropylamine, α - methyl-, 413^{3}.

$C_8H_{13}NO_2$ (See also *Arecoline*.)
Nicotinic acid, tetrahydro - 1,4 - dimethyl-, *and derivs.*, $1810^{5,6}$.
NO_2Te 1,2 - Telluropyran - 3,5(4,6)-dione, 4 - ethyl - 2 - methyl-, monoxime, 413^{6}.

$C_8H_{13}NO_5$ Aspartic acid, *N* - acetyl-, di-Me ester, 1056^{9}.

$C_8H_{13}NO_6$ Propionic acid, α,α′ - [(carboxymethyl)imino]bis-, *and Cu salt*, 3283^{5}.

$C_8H_{13}N_3O_2$ Δ^2 - Cyclopentenone, 2 - methoxy-3 - methyl-, semicarbazone, 2484^{9}.

$C_8H_{13}N_3O_4$ 4 - Imidazolecarboxamide, 4 - ethoxy-*N* - ethyltetrahydro - 2,5 - diketo-, 3691^{5}.

$C_8H_{13}N_3S$ Δ^2 - Cyclohexenone, 3 - methyl-, thiosemicarbazone, 3161^{2}.

$C_8H_{13}N_3O$ 4 - Pyrazolealdehyde, 1,3,5 - trimethyl-, semicarbazone, 2857^{1}.

C_8H_{14} Octadiene, 3155^{6}.

$C_8H_{14}BrNO_3$ Isobutyric acid, α - (α - bromoisobutyrylamino)-, 1629^{1}.

$C_8H_{14}BrNS$ Trimethyl - 2 - thienylmethylammonium bromide, 390^{9}.

$C_8H_{14}Br_2O_2$ Butyric acid, γ - bromo - α - (β-bromoethyl)-, Et ester, 385^{5}.

$C_8H_{14}ClNO_3$ Isobutyric acid, (α - chloroacetamido)-, Et ester, 3299^{2}.

$C_8H_{14}N_2O$ Pyrazole, 5 - ethoxy - 4 - ethyl - 3-methyl-, 2855^{7}.
5 - Pyrazolone, 4,4 - diethyl - 3 - methyl-, 1990^{3}.

$C_8H_{14}N_2O_2$ 2,5-Piperazinedione, 3-isobutyl-, 420^{4}.
—, 3,3,6,6-tetramethyl-, 1629^{2}.
2,5 - Pyrazinediol, 1,4-dihydro - 3 - isobutyl-, 3169^{5}.
2(1) - Pyrazinone, 3,6 - diethyl - 3,4 - dihydro - 5 - hydroxy-, 1629^{2}.
—, 3,4 - dihydro - 5 - hydroxy - 3 - isobutyl-, 1629^{1}.
—, 3,4 - dihydro - 5 - hydroxy - 6 - isopropyl-3-methyl-, 1629^{2}.

$C_8H_{14}N_2O_2Te$ 1,2 - Telluropyran - 3,5(4,6)-dione, 4 - ethyl - 2 - methyl-, dioxime, 413^{6}.

$C_8H_{14}N_2O_3$ Cyclopentanol, 2-methyl-, allophanate, $1790^{8,9}$.

$C_8H_{14}N_2O_5$ Allophanic acid, γ - (carboxymethyl)-, di-Et ester, 2160^{9}.
Glutathione, 3446^{1}.
Glycine, *N* - (β - carbomethoxyaminobutyryl)-, 44^{5}.

$C_8H_{14}N_2O_5S$ Glutathione, 228^{5}, 426^{4}.

$C_8H_{14}N_4O$ Guanidine, α - (2 - methoxy - 3-methyl - Δ^2 - cyclopentenylideneamino)-, *-HNO_3*, 2484^{9}.

$C_8H_{14}N_4O_3$ 4 - Imidazolecarboxamide, tetrahydro - 2 - keto - *N*,3 - dimethyl - 5-methylimino - 4 - methoxy-, 1388^{1}.
2(5) - Imidazolone, 4 - (α,β - dimethylcarbamido) - 5 - methoxy-(?), *and salts*, 1387^{9}.

$C_8H_{14}N_4O_3S_2$ Triacetyl deriv., m. 151–2°, of thiourea, 1220^{3}.

$C_8H_{14}N_4O_4$ Butanetetracarboxamide, 3446^{5}.

$C_8H_{14}N_4O_4Pd$ Glyoxime, dimethyl-, Pd deriv., 1042^{7}.

$C_8H_{14}N_4O_4Pt$ Glyoxime, dimethyl-, Pt deriv., 1042^{7}.

$C_8H_{14}N_6O_2$ 1,2 - Cyclopentanedione, 3 - methyl-, disemicarbazone, 2484^{8}.

$C_8H_{14}O$ Acetophenone, hexahydro-, 1982^{2}.
Cyclohexanone, 2,5 - dimethyl-, $2149^{7,8}$, 2150^{4}.
Cyclooctanone, 1792^{6}, 2151^{6}.
Δ - 2 - Heptenone, 6 - methyl-, 1593^{5}, 3686^{9}.
1 - Heptin - 3 - ol, 3 - methyl-, 2481^{6}.
1 - Hexin - 3 - ol, 3,6 - dimethyl-, 2481^{6}.

$C_8H_{14}O_2$ Cyclohexaneacetic acid, 3160^{4}.
Cyclohexanol, acetate, 1396^{4}, 2491^{7}.
Cyclohexanone, 2-ethoxy-, 2665^{4}.
Phenetole, 1,2 - epoxyhexahydro-, 2665^{4}.

$C_8H_{14}O_3$ Butyric anhydride, 2818^{7}.
Caprylic acid, α-keto-, *Ca salt*, 1593^{1}.
Cyclohexaneacetic acid, α hydroxy-, 378^{4}.
4 - Pyrancarboxylic acid, tetrahydro - 2,6-dimethyl-, 1624^{3}.

$C_8H_{14}O_4$ Adipic acid, mono-Et ester, 3689^{6}.
Ethanediol, dipropionate, 3621^{6}.
Malonic acid, methyl-, di-Et ester, P 917^{1}, 1056^{2}.
Malonic acid, mono-Am ester, 3689^{7}.
Oxalic acid, di-Pr ester, 3689^{5}.

Suberic acid, 2151^5, 2937^4.
Succinic acid di-Et ester, 3689^6; mono-Bu ester, 3689^5.
$C_8H_{14}O_4Te$ Acetic acid, tellurobis-, di-Et ester, 2315^8.
$C_8H_{14}O_5$ γ - Arabonolactone, trimethyl-, 3445^6.
Arabonic acid, trimethyl-, γ-lactone, 1060^4.
Malic acid, di-Et ester, 1594^2.
Xylose, trimethyl-, lactone, 2314^{3,4}.
$C_8H_{14}O_6$ Gluconic acid, 2,3 - dimethyl-, lactone, 580^8.
Suberic acid, α,ζ - dihydroxy-, 2830^9.
Succinic acid, α,β - dimethoxy-, di-Me ester, 47^9.
Tartaric acid, di-Et ester, 48^1.
$C_8H_{14}O_7$ Arabotrimethoxyglutaric acid, *and Na salt*, 1059^9.
$C_8H_{14}O_7S$ Malic acid, di-Me ester, ethanesulfonate, 1056^8.
$C_8H_{14}O_8$ Galactonic acid, monoacetate, 1059^1.
$C_8H_{15}Br$ Cycloheptane, (bromomethyl)-, 3012^5.
Cyclohexane, (bromoethyl)-, 1599^4, 3160^1.
$C_8H_{15}Cl$ 2-Octene, 2-chloro-, 1592^9.
$C_8H_{15}ClO$ Ethylene oxide, α-chloro-β-hexyl-, 1592^9.
$C_8H_{15}ClO_2$ 2 - Heptanone, 3 - chloro - 4 - hydroxy-6-methyl-, 1787^1.
$C_8H_{15}CuNO_2$ 4 - Octanone, 5 - hydroxy-, oxime, Cu deriv., 1055^6.
$C_8H_{15}NO$ (See also *Pelletierine; Tropine.*)
Pseudotropine, 2108^5.
Valeronitrile, α - hydroxy - α - propyl-, 1787^3
$C_8H_{15}NO_2$ Cyclohexaneacetamide, α-hydroxy-, 378^5.
Nipecotic acid, 1,4 - dimethyl-, *and chloroaurate*, 1810^6.
4 - Pyrancarboxamide, tetrahydro - 2,6-dimethyl-, 1624^4.
$C_8H_{15}NO_3$ Leucine, *N*-acetyl-, 2983^4.
Nipecotic acid, 4 - hydroxy - 1,4 - dimethyl , *and derivs* , 1809^7, 1810^{4,5}.
$C_8H_{15}NO_3S$ Lactic acid, dimethylthionocarbamate, Et ester, 3281^{2,5}.
$C_8H_{15}NO_4$ + H_2O Diacetonamine, oxalate, 3280^5.
$C_8H_{15}NS$ Isothiocyanic acid, heptyl ester, 2835^3.
$C_8H_{15}N_3O$ Cycloheptanone, semicarbazone, 2150^9.
$C_8H_{15}N_3O_2$ Cyclopentanone, 2-methoxy-3-methyl-, semicarbazone, 2484^9.
$C_8H_{15}N_3O_3$ Acetoacetic acid, α-ethyl-, Me ester, semicarbazone, 1990^6.
—, α - methyl-, Et ester, semicarbazone, 1990^6.
$C_8H_{15}N_3O_4$ Alanine, *N* - (*N* - glycylalanyl)-, 3299^1.
Carbamic acid, [β-(carbamylmethylcarbamyl)isopropyl]-, Me ester, 44^5.
$C_8H_{15}N_5O_5$ Protoctin, 3703^3.
C_8H_{16} Cyclohexane, dimethyl-, 171^{4,5}, 2935^7.
—, ethyl-, 171^4.
Cyclopentane, isopropyl-, 171^3.
—, propyl-, 171^3.
1-Octene, 3444^1.
$C_8H_{16}BrN_3O$ 2 - Heptanone, 1 - bromo , semicarbazone, 1783^4.
$C_8H_{16}Br_2$ Octane, 1,2-dibromo-, 3444^1.
$C_8H_{16}Cu_2N_4$, 3401^1.
$C_8H_{16}NO_3P$ Propanephosphonic acid, γ - cyano-, di-Et ester, 2079^1.
$C_8H_{16}N_2$ Butyraldehyde, azine, 3282^6.
Isobutyraldehyde, azine, 899^9, 2309^6, 3282^6.
$C_8H_{16}N_2O_3$ Carbamic acid, ethoxyiminomethyl-, butyl ester, 3164^5.
Glycine, *N*-leucyl-, 3298^7.
Isobutyric acid, α - (α - aminoisobutyrylamino)-, 1629^1.
Leucine, *N*-glycyl-, 3298^7.
$C_8H_{16}N_2O_4$ Urea, α - ethoxyacetyl - β - (ethoxymethyl)-, 3284^4.
$C_8H_{16}N_2O_6$ *d*-Glucose, methylureide, 1595^9.
$C_8H_{16}O$ Cycloheptanecarbinol, 3012^5.
Cyclohexanecarbinol, α-methyl-, 3286^9.
Cyclohexaneëthanol, 1599^2, 3159^9.
Cyclohexanol, 2,5-dimethyl-, 2149^{5,6,7}.
Cyclopentanepropanol, 1598^9.
Δ^1 - 4 - Heptenol, 4 - methyl-, 1602^4.
2 - Hexanone, 3,3-dimethyl-, 2483^1.
2 - Pentanone, 3,3,4 - trimethyl-, 2483^2
$C_8H_{16}O_2$ Butyric acid, Bu ester, 39^6, P 1813^6.
Caprylic acid, 427^1, 1751^9, *salts*, 2818^1, 3617^8.
Ethylene oxide, α - *tert* - butyl - α - hydroxy-β,β-dimethyl-, 1593^1
2 - Heptanone, hydroxymethyl-, 1593^6, 2481^7.
Hexanone, 4 - ethyl - 4 - hydroxy-, 47^4.
—, 3 - hydroxy - 3,5 - dimethyl-, 2481^7.
2-Octanone, 3-hydroxy-, 1593^1.
2 - Pentanone, 3 - hydroxy - 3,4,4 - trimethyl-, 1593^4.
Valeric acid, α,α - dimethyl-, Me ester, 2483^1.
—, α-propyl-, *Tl salt*, 2818^2.
$C_8H_{16}O_3$ Caproic acid, α - hydroxy - β,β - dimethyl , 2483^2.
Isocaproic acid, α - hydroxy-, Et ester, 1786^4
$C_8H_{16}O_4$ Acetic acid, diethoxy-, Et ester, 388^5.
5,5 - *m* - Dioxanedicarbinol, 2,2 - dimethyl-, 2109^2
$C_8H_{16}O_5$ Xylose, trimethyl-, 2314^3
$C_8H_{16}O_6$ Fructoside, methylmethyl-, 3285^4.
d-Glucose, 2,3 dimethyl-, 2987^9
$C_8H_{17}BrHg$ Octylmercuric bromide, 362^7.
$C_8H_{17}BrO_2$ Butyraldehyde, β - bromo-, di-Et acetal, 1788^4.
$C_8H_{17}I$ Octane, iodo , 3156^4
$C_8H_{17}N$ See *Coniine.*
$C_8H_{17}NO$ Cyclohexanol, 2 - dimethylamino , *and -HCl*, 2831^7
2 - Pentanone, 3,3,4 - trimethyl-, oxime, 2483^2.
$C_8H_{17}NO_2$ 1,3 - Dioxolane - 4 - methylamine, *N*, *N*,2,2-tetramethyl , 2816^2.
$C_8H_{17}NO_2S$ Thiomorpholine, 4-butyl-, 1-dioxide, *and -HCl*, 40^2.
—, 4 - isobutyl-, 1 - dioxide, *and -HCl*, 40^2.
$C_8H_{17}NS$ Thiomorpholine, 4 - butyl-, 40^1.
—, 4-isobutyl-, 40^1.
$C_8H_{17}N_3$ Butyronitrile, α,γ - bis(dimethylamino)-, 1053^4.
$C_8H_{17}N_3O$ Butyraldehyde, α - ethyl α - methyl-, semicarbazone, 2481^4.
$C_8H_{17}N_3OS_2$ 2 - Propanone, 1,3 - bis(ethylmercapto)-, semicarbazone, 737^2.
$C_8H_{17}N_3O_2$ 3 - Hexanone, 4 - hydroxy - 4 - methyl-(?), semicarbazone, 2481^5.
2 - Pentanone, 3 - hydroxy - 3,4 - dimethyl-, semicarbazone, 2481^7.
C_8H_{18} See *Heptane, methyl-; Octane.*
$C_8H_{18}BrN$ Quaternary base, m. 214°, 390^4.
$C_8H_{18}BrNO_2$ (α - Carboxyethyl)trimethylammonium bromide, Et ester, 3688^8.
$C_8H_{18}Br_2Pb$ Plumbane, dibromodibutyl-, 1589^9.
$C_8H_{18}Cl_2OPt_2S_4$, 1570^9.
$C_8H_{18}Cl_4N_6NiPtS_2$ Triaminotriethylaminenick-

elous platinic tetrachloride dithiocyanate, 1589[1].
$C_8H_{18}Cu_2N_6O$, 3401[1].
$C_8H_{18}INO_2$ (β - Hydroxyisopropyl)trimethylammonium iodide, acetate, 1271[7].
$C_8H_{18}MoN_6O_7$ Diguanidine pyrogallolaquomolybdate, 557[1].
$C_8H_{18}N_2$ Piperazine, 1,2,4,5 - tetramethyl-, *and salts*, 398[6].
$C_8H_{18}N_6NiS_2$ Triaminotriethylaminenickelous thiocyanate, 1589[1].
$C_8H_{18}O$ Butyl ether, 361[9], 544[2].
sec-Butyl ether, 361[9].
Isobutyl ether, 361[9], 577[2].
2-Octanol, 39[6], 3280[3].
Octyl alcohol, 427[6], 3258[1].
$C_8H_{18}OSSe_2$ Sulfoxide, bis(β - ethylselenylethyl), 1051[6].
$C_8H_{18}O_2$ Butanone, di-Et acetal, 2937[7].
2,3 - Hexanediol, dimethyl-, 1786[4], 2482[9], 2483[1].
2,3 - Pentanediol, 2,3,4-trimethyl-, 2482[9], 2483[2].
$C_8H_{18}O_2S$ Butyl sulfone, 1784[2].
$C_8H_{18}O_2SSe_2$ Sulfone, bis(β - ethylselenylethyl), 1051[6].
$C_8H_{18}O_2S_2$ Disulfide, bis(β - ethoxyethyl), 737[4].
$C_8H_{18}O_3$ Propanediol, isoamoxy-, 3688[4].
$C_8H_{18}O_3S$ Butyl sulfite, 3693[9].
$C_8H_{18}O_4S_2$ See *Trional*.
$C_8H_{18}S$ Butyl sulfide, 1784[2].
Isobutyl sulfide, 278[8].
Sulfide, butyl isobutyl, 2991[2].
$C_8H_{18}SSe_2$ Sulfide, bis(β - ethylselenylethyl), 1051[6].
$C_8H_{18}Se_2$ Butane, 2,2-bis(ethylselenyl)-, 1051[5].
$C_8H_{18}Zn$, 2468[1].
$C_8H_{19}IN_2S$ Pseudourea, α,β - diethyl - α,γ - dimethylthio-, methiodide, 374[4].
$C_8H_{19}N$ Butylamine, N, N-diethyl-, 3688[6].
—, N,N,α,α - tetramethyl-, *and salts*, 1053[7], 3280[4].
sec - Butylamine, α - ethyl - N, N - dimethyl-, 1053[3].
Diisobutylamine, 372[4].
$C_8H_{19}NO$ 1 - Butanol, 3 - diethylamino , 1788[7]
$C_8H_{19}NO_2$ Butyraldehyde, β-amino-, di-Et acetal, *and - HCl*, 1788[6].
2 - Propanol, 1,1′ - (ethylimino)bis-, 2821[1].
$C_8H_{19}N_3$ Guanidine, diethyltrimethyl-, 374[8].
$C_8H_{20}Al_2I_2$ Diethylaluminum iodide, 361[6].
$C_8H_{20}Au_2Cl_8S_2$ Ethylenebis[ethylmethylsulfonium chloroaurate], 1217[6].
$C_8H_{20}CdI_4S_2$ Ethylenebis[ethylmethylsulfonium cadmium chloride], 1217[6].
$C_8H_{20}Cl_2N_2$ 1,1,4,4 - Tetramethylpiperazinium dichloride, 398[4].
$C_8H_{20}Cl_2O_8S_2$ Ethylenebis[ethylmethylsulfonium perchlorate], 1217[6].
$C_8H_{20}Cl_2PtS_2$, 1569[9].
$C_8H_{20}Cl_2PtS_2$, 1569[9].
$C_8H_{20}Cl_4N_2Pt_2$, 2626[8].
$C_8H_{20}Cl_4PtS_2$, 1569[9].
$C_8H_{20}Cl_4PtS_2$, 1569[9].
$C_8H_{20}Cl_6Hg_2S_2$ Ethylenebis[ethylmethylsulfonium mercuric chloride], 1217[6].
$C_8H_{20}Cl_6S_2Pt$ Ethylenebis[ethylmethylsulfonium] chloroplatinate, 1217[6].
$C_8H_{20}INO$ (Ethoxymethyl)diethylmethylammonium iodide, 2309[7].
$C_8H_{20}I_2N_2$ 1,1,4,4 - Tetramethylpiperazinium diiodide, 398[4].
$C_8H_{20}I_2S_2$ Ethylenebis[ethylmethylsulfonium iodide], 1217[4,5].
$C_8H_{20}N_2OS$ Ethylamine, β,β' - sulfinylbis[N, N-dimethyl-, *di-HCl*, 40[3].
$C_8H_{20}N_2O_2S$ Ethylamine, β,β'-sulfonylbis [N, N - dimethyl-, *and di-HCl*, 40[3].
$C_8H_{20}N_2O_4S$ 1,1,4,4 - Tetramethylpiperazinium sulfate, 398[4].
$C_8H_{20}N_2O_8$ 2 - Propanol, 1 - hydroxamino-, oxalate, 1052[2].
$C_8H_{20}Pb$ See *Plumbane, tetraethyl-*.
$C_8H_{21}NO$ Tetraethylammonium hydroxide, 3747[4].
$C_8H_{22}N_2O_2$ 1,1,4,4 - Tetramethylpiperazinium dihydroxide, 398[4].
$C_8H_{24}BrLiO_4$, 1746[4].
$C_8H_{24}Br_2CaO_4$, 1746[4].
$C_8H_{24}CuN_6O_4$ + $4H_2O$, 3401[3].
$C_8H_{24}Mo_4N_4O_{22}$ Ammonium dimolybdomalate, 1184[8].
$C_8H_{32}Cl_7FeN_4$, 25[6].
$C_8H_{32}I_2N_{16}PbS_8$ + $2H_2O$, 3657[1].
$C_8HgK_6O_{16}$ + $4H_2O$ Mercury potassium oxalates, 2466[6].
$C_8K_4MoN_8$ Potassium molybdenum cyanide, 698[2].
$C_9H_3Cl_5O_2$ Phthalyl chloride, 4 - (trichloromethyl)-, 184[7].
$C_9H_3Cl_7O$ 2,4 - Xyloyl chloride, α - hexachloro-, 184[7].
$C_9H_4Br_2OS$ Thiochromone, 3,6 - dibromo-, 198[6].
$C_9H_4Cl_2O$ Indone, 2,3-dichloro-, 3002[1].
$C_9H_4Cl_6O$ 2,4 - Xyloyl chloride, $\alpha^2,\alpha^2,\alpha^4,\alpha^4,\alpha$?-pentachloro-, 184[6].
$C_9H_4Cl_6O_2$ 2,4-Xylic acid, α-hexachloro-, 184[7].
$C_9H_5BrClNO_2$ 2,3 - Quinolinediol, 6 - bromo-5-chloro-, 2681[4].
C_9H_5BrOS Thiochromone, 3 (and 6)-bromo-, 198[6].
$C_9H_5BrO_2$ Chromone, 3-bromo-, 198[9].
$C_9H_5BrO_2S$ Thiochromone, 2 - bromo - 3 - hydroxy-, 198[4].
$C_9H_5Br_2NO_2$ 2,3-Quinolinedione, 6,8-dibromo-1,4-dihydro-, 2681[4].
Salicylonitrile, 3,5-dibromo-, acetate, 403[9].
$C_9H_5Br_2N_3O_2$ Imidazole, 4,5-dibromo-2-(nitrophenyl)-, 2326[9].
$C_9H_5Br_3OS$ 4-Thiochromanone, 3,3,6-tribromo-, 197[4].
C_9H_5ClOS Thiochromone, 6-chloro-, 202[7].
$C_9H_5Cl_2NO_2$ Anthranil, acetyl-3,5-dichloro-, 908[6].
$C_9H_5Cl_2N_3O$ 1,2,3 - Triazole - 4 - carboxylyl chloride, 5 - chloro - 1 - phenyl-, 416[9].
$C_9H_5Cl_3O_2$ Phthalide, 2 - chloro - 4 - (dichloromethyl)-, 184[4].
$C_9H_5Cl_5O$ 2,4 Xyloyl chloride, $\alpha^2,\alpha^2,\alpha^4,\alpha^4$-tetrachloro-, 184[5].
$C_9H_5Cl_6NO$ 2,4-Xylamide, α-hexachloro-, 184[7].
$C_9H_5N_3O$ Propiolyl azide, phenyl-, 2157[4].
$C_9H_6BrClOS$ 4 - Thiochromanone, 3 - bromo-6-chloro-, 202[6].
C_9H_6BrN Cinnamonitrile, α-bromo-, 760[3].
$C_9H_6BrNO_2$ 2,3 - Quinolinedione, 6 - bromo-1,4-dihydro-, and isomer(?), 2681[3].
$C_9H_6BrN_3O_2$ Imidazole, 4 (or 5) - bromo - 2-(p-nitrophenyl)-, 2327[1].
$C_9H_6BrN_3O_3$ 2(1) - Benzofuranone, 4 - bromo-5-methoxy-1-triazo-, 3004[4].
$C_9H_6Br_2N_2$ Imidazole, 4,5 - dibromo - 2 - phenyl-, *and - HCl*, 2326[9].
$C_9H_6Br_2OS$ 4 - Thiochromanone, 3,3 (and 3,6)-dibromo-, 197[4].
Thiochromone, dibromide, 198[7]

$C_9H_6Br_2O_2$ 4 - Chromanone, 2,3 - dibromo-, 197^8.
Styrene, α,2 - dibromo - 4,5 - methylenedioxy-(?), 3292^5.
$C_9H_6ClNO_2$ 2,3 - Quinolinedione, 6 - chloro-1,4-dihydro-, 2681^3.
$C_9H_6ClN_3O_2$ 1,2,3-Triazole-4-carboxylic acid, 5-chloro-1-phenyl-, 416^9.
$C_9H_6Cl_4O_2$ 2,4 - Xylic acid, $\alpha^2,\alpha^2,\alpha^4,\alpha^4$ - tetrachloro-, 184^4.
$C_9H_6INO_4S$ See *Yatren*.
$C_9H_6N_4$ Imidazobenzotriazine, *and -HCl*, 395^4.
C_9H_6OS Thiochromone, 198^6.
$C_9H_6O_2$ (See also *Coumarin*.)
Propiolic acid, phenyl-, *Ag salt*, 409^5.
$C_9H_6O_3$ Chromone, 7-hydroxy-, $605^{7,9}$.
Phthalide, 4-formyl-, 184^4.
$C_9H_6O_3S$ Thiochromone, *S*-dioxide, 199^2.
$C_9H_6O_4$ Benzoic acid, 2,4-diformyl-, 184^5.
4 - Isobenzofurancarboxylic acid, 1,2 - dihydro-1-keto-, 184^4.
$C_9H_6O_5$ Phthalonic acid, 1613^9.
Terephthalic acid, 2-formyl-, 184^4.
$C_9H_6O_6$ Trimellitic acid, *Ca salt*, 184^8.
$C_9H_7AgN_4O_3$ 1,2,4 - Triazol - 5 - ol, 1 - methyl-3 - (*p* - nitrophenyl)-, Ag deriv., 914^9.
$C_9H_7BiO_4$ Caffeic acid, complex Bi compd, *Na salt*, 796^4.
C_9H_7Br Benzene, (γ - bromopropargyl)-, 1783^2.
$C_9H_7BrN_2$ Imidazole, 4 (or 5) - bromo - 2 - phenyl-, *and -HCl*, 2327^1.
Pyrazole, 4 - bromo - 3 (or 5) - phenyl-, *-HBr*, 760^7.
$C_9H_7BrN_2OS$ Benzothiazole, 1-acetamido 5 bromo-, 2858^4.
Benzothiazoline, 2-acetyl-5-bromo-1-imino-, 2858^4.
$C_9H_7BrN_4O_3$ 1,2,3,5-Tetrazole, 4-(5-bromo-2-hydroxyanisoyl)-, 3004^5.
C_9H_7BrO Anisole, *p*-(bromoethinyl)-, 1783^2
Cresol, (bromoethinyl), 1783^2.
C_9H_7BrOS 4 - Thiochromanone, bromo-, 197^4, 202^6.
$C_9H_7BrO_2$ Cinnamic acid, α-bromo-, 1612^8.
Phthalide, 4-bromomethyl-, 184^2.
$C_9H_7BrO_3S$ 4 - Thiochromanone, 3-bromo-, *S*-dioxide, 199^1.
$C_9H_7Br_2I$ Benzene, (β,γ - dibromo - γ - iodoallyl)-, 1783^7.
$C_9H_7Br_2NO$ Benzisoxazole, 4,6-dibromo-3,5-dimethyl-, 403^9.
Xylonitrile, 3,5-dibromohydroxy-, $403^{8,9}$.
$C_9H_7Br_2O$ 2,4 - Xyloyl bromide, α^2,α^4 - dibromo-, 184^2.
$C_9H_7ClN_2O_6$ Benzoic acid, 3,5-dinitro-, β-chloroethyl ester, 361^4.
$C_9H_7ClN_4O$ 1,2,3 - Triazole - 4 - carboxamide, 5-chloro-1-phenyl-, 416^9.
C_9H_7ClOS 4 - Thiochromanone, 6 - chloro-, 202^3.
$C_9H_7ClO_2$ Cinnamic acid, *p*-chloro-, P 1631^4.
Phthalide, 4-chloromethyl-, 184^2.
$C_9H_7ClO_3$ Acetophenone, 5-chloro-α-formyl-2-hydroxy-, 1238^1.
Benzaldehyde, 2 - chloro - 3 - hydroxy-, acetate, 1065^3.
$C_9H_7ClO_4$ Salicylic acid, 3-acetyl-5-chloro-, 1238^8.
$C_9H_7Cl_2NO_2$ Lutidinedicarboxylyl chloride, *and PtCl₄ compd.*, 1226^3.
$C_9H_7Cl_2NO_3$ Anthranilic acid, *N*-acetyl-3,5-dichloro-, 908^4.
$C_9H_7Cl_2N_3O_2$ 1,2,3 - Benzotriazole, 1 - carboxyoxy - 5,6 - dichloro-, Et ester, 750^7.
$C_9H_7Cl_3N_2O_3$ *m* - Acetotoluide, α,2,4 - trichloro-6-nitro-, 2834^8.
C_9H_7I Benzene, (γ - iodopropargyl)-, 1783^3.
C_9H_7IO Cresol, iodoethinyl-, 1783^3.
$C_9H_7I_3O$ Cresol, triiodovinyl-, 1783^7.
$C_9H_7KN_4O_3$ 1,2,4 - Triazol - 5 - ol, 1 - methyl-3 - (*p* - nitrophenyl)-, K deriv., 914^9.
C_9H_7N (See also *Isoquinoline; Quinoline.*)
Cinnamonitrile, 760^3; *-HCl*, 3291^1.
C_9H_7NO 1,2 - Benzopyran, 2 - imino-, *-HCl*, 3291^7.
Carbostyril, 418^3.
o - Coumaronitrile, *and di-HCl*, 3290^9.
Indoxyl, P 423^8.
Isoxazole, 3(and 5) - phenyl-, $760^{8,9}$.
Propiolaldehyde, β - phenyl-, oxime, 759^6.
C_9H_7NOS Acetophenone, *o*-thiocyano-, 2995^2.
2-Quinolinol, 3-mercapto-, 1627^3.
$C_9H_7NOS_2$ Rhodanine, 3-phenyl-, 600^5.
$C_9H_7NO_2$ Anisoyl cyanide, 2324^2.
Isatin, methyl, 758^5, 3455^8.
3,4-Isoquinolinediol, 2681^3.
Pseudoisatin, 4(and 6)-methyl-, 193^1.
$C_9H_7NO_3$ Isatoic anhydride, *N*-methyl-, 207^3.
$C_9H_7NO_4$ Atropic acid, *p*-nitro, 1414^1.
Cinnamic acid, nitro-, 182^4, P 1631^4.
6-Phenomorpholinecarboxylic acid, 3-keto-, 1068^9.
$C_9H_7NO_5$ Acetic acid, *o*-nitrobenzoyl-, 1079^3.
Terephthalic acid, 2-formyl-, oxime, 184^4.
$C_9H_7NO_5S$ Methanesulfonic acid, phthalimido-, *and Ba salt*, 1805^5.
$C_9H_7NO_6$ 2 - Picoline - 3,4,6 - tricarboxylic acid, *tri-Tl salt*, 49^7.
$C_9H_7N_2NaO_3$ Cinnamaldehyde, *m* - nitro-, oxime, Na salt, 3450^4.
$C_9H_7N_3O_2$ 1,2,3 - Benzotriazin - 4(3) - one, 3-acetyl-, 382^1.
$C_9H_7N_3O_3$ Glyoxylanilide, α - cyano-, *N* - oxide, oxime, 2822^3.
$C_9H_7N_4NaO_3$ 1,2,4 - Triazol - 5 - ol, 1 - methyl-3 - (*p* - nitrophenyl)-, Na deriv., 914^9.
C_9H_8 See *Indene*.
$C_9H_8AgNO_3S$ Benzoic acid, 4 - acetamido - 2-mercapto, silver deriv., *Na salt*, P 800^7.
$C_9H_8AuNO_3S$ Benzoic acid, 4 - acetamido - 2-mercapto-, gold deriv., *Na salt*, P 800^7.
C_9H_8BrNO Cinnamaldehyde, α - bromo-, oxime, 759^6.
$C_9H_8BrNO_2$ Benzaldehyde, *o*-bromo-, oxime, Ac deriv., 179^7.
$C_9H_8BrNO_3$ Benzoic acid, 2-acetamido-3-bromo-, 3288^9.
Hippuric acid, bromo-, 2354^1.
$C_9H_8BrNO_4$ Benzoic acid, 3 - bromo - 2 - nitro-, Et ester, 3289^1.
$C_9H_8BrNO_5$ Benzyl alcohol, 3 (and 5) - bromo-2 - hydroxy - 5 (and 3) - nitro-, acetates, 1610^8.
$C_9H_8BrN_3O_7$ Urea, β - (4 - bromo - 2,6 - dinitrophenyl) - α - ethyl - α - nitro-, 590^2.
$C_9H_8Br_2N_2OS$ Benzothiazoline, 2-acetyl-1-imino-, dibromide, *and -HBr*, $2858^{1,3}$.
$C_9H_8Br_2N_6O$ 3,4,5-Hemimellitenol, 2,6-dibromo-α^4,α^4-ditriazo-, 403^9.
Isopseudocumenol, 4,6 - dibromo - α^2,α^1-ditriazo-, 403^9.
$C_9H_8Br_2O$ 2,4 - Xyloyl bromide, α^2 - bromo-, 183^9.
$C_9H_8Br_2O_2$ 2,4-Xylic acid, α^2,α^4 - 184^2.

$C_9H_8Br_2O_3S$ 2-Propanone, 1 - bromo - 3 - (*p*-bromophenylsulfonyl)-, 1625[9].
$C_9H_8Br_4N_2OS$ Benzothiazole, 1 - acetamido-, tetrabromide, 2857[9].
$C_9H_8Br_6N_2OS$ Benzothiazole, 1-acetamido-, hexabromide, 2858[4].
$C_9H_8ClFe_2O_{11}$, 1769[1].
$C_9H_8ClNO_2$ Glyoxylyl chloride, *p*-tolyl-, oxime, 360[4].
$C_9H_8ClNO_3$ Ether, allyl 4-chloro-2-nitrophenyl, 3694[6].
Hippuric acid, chloro-, 2354[2].
$C_9H_8ClNO_4$ Benzoyl chloride, 4-ethoxy-3-nitro-, 394[6].
$C_9H_8ClN_3O_2$ 2(1) - Benzofuranone, 4 - chloro , semicarbazone, 1237[9].
$C_9H_8ClN_5O_7$ Urea, *β*-(chlorodinitrophenyl)-*α*-ethyl *α*-nitro-, 590[2,3].
$C_9H_8Cl_2N_2O_3$ *m* - Acetotoluide, 2,4 - dichloro-6-nitro-, 2834[2].
$C_9H_8INO_3$ Hippuric acid, iodo-, 2354[2].
C_9H_8NNaO Cinnamaldehyde, oxime, Na salt, 3450[6].
$C_9H_8N_2O$ Propiolic acid, phenyl-, hydrazide, *and* - *HCl*, 2157[3].
$C_9H_8N_2OS$ Benzothiazole, 1 - acetamido-, 2857[9].
Benzothiazoline, 2-acetyl-1-imino-, 2858[1].
$C_9H_8N_2O_2$ 2 - Benzimidazolol, acetate, 381[9].
2-Indazoleacetic acid, 1622[6].
1-Isoindazoleacetic acid, 1622[6].
1 - Phthalazinol, 4 - methoxy-, 185[4].
1(2) - Phthalazone, 4 - methoxy-, 382[1].
$C_9H_8N_2O_3$ Cinnamaldehyde, *m*-nitro-, oxime, 3450[6].
$C_9H_8N_2O_3S$ 1 - Thionaphthenecarboxamide, 2-amino-(?), *S*-dioxide, 1069[4].
—, 1,2-dihydro-2-imino-(?), *S*-dioxide, 1069[4].
$C_9H_8N_2O_4$ Benzaldehyde, nitro-, oxime, Ac deriv., 179[5].
Picolinic acid, 5-cyano-4,6-dimethoxy-, 915[2].
$C_9H_8N_2O_5$ Ether, allyl 2,4-dinitrophenyl, 2319[7], 3694[6].
$C_9H_8N_2O_6$ Acetophenone, 2-hydroxy-5-methyl-6, ?-dinitro-, 1237[8].
$C_9H_8N_4O_2$ 1,2,3 - Benzotriaz - 4(3) - one, 3 acetamido-, 206[7].
1,2,3,5 - Tetrazole, 1 - methyl - 4 - salicylyl-, 3004[7].
$C_9H_8N_4O_3$ 1,2,4 - Triazol - 5 - ol, 1 - methyl - 3-(*p*-nitrophenyl) , 914[9].
$C_9H_8N_4O_6$ 5,5′ - Spirobi[hydantoin], diacetyl-, 2826[4].
$C_9H_8N_4O_8$ Hydroxylamine, *β* - (2,4,6 - trinitro - *m* - tolyl)-, acetate, 2667[1].
$C_9H_8N_6O_9$ Urea, *α* - ethyl - *α* - nitro - *β* - (2,4,6-trinitrophenyl)-, 590[1].
C_9H_8O (See also *Cinnamaldehyde*.)
Benzyl alcohol, *α*-ethinyl , 3444[4].
1-Indanone, 1618[8], 1619[8].
2-Propine-1-ol, 3-phenyl-, 2978[1].
C_9H_8OS 4-Thiochromanone, 204[1].
$C_9H_8O_2$ (See also *Cinnamic acid*.)
Acrylophenone, *β*-hydroxy-, 3006[1].
p - Benzoisopyrazolone, Ac deriv., 1066[8].
Chromanone, 204[2]; *salts*, 201[8].
2 - Furan - *α*,*γ* - pentadienaldehyde, 1235[4].
Phthalide, 4-methyl-, 184[1].
$C_9H_8O_3$ Acetic acid, benzoyl-, 56[9].
4-Chromanone, 7-hydroxy-, 605[7].
Phthalide, 4 - hydroxymethyl-, 184[3].
Pyruvic acid, phenyl-, 56[9].
$C_9H_8O_3S$ 4 - Thiochromanone, *S* - dioxide, 198[9].
$C_9H_8O_4$ (See also *Acetylsalicylic acid*.)
Benzaldehyde, *p*-carboxyoxy-, Me ester, 376[1].
Benzoic acid, *m* (and *p*) - hydroxy-, acetate, 1613[6].
Peroxide, acetyl benzoyl, 1385[8].
$C_9H_8O_5$ Gentisic acid, 5-acetate, 1613[6].
Protocatechuic acid, acetate, 1613[7].
β-Resorcylic acid, 4-acetate, 1613[6].
Terephthalic acid, 2-hydroxymethyl-, 184[4].
$C_9H_8O_5S$ Benzoic acid, *o* - (carboxymethylsulfinyl)-, 2995[4].
$C_9H_8O_6$ Benzoic acid, 2,4,6 - trihydroxy-, 4-acetate, 1613[9].
Gallic acid, monoacetate, 1613[8].
$C_9H_8O_6S$ Acetic acid, *o*-sulfobenzoyl-, 1069[3].
Benzoic acid, *o* - (carboxymethylsulfonyl)-, 2995[4].
$C_9H_8O_7$ Gallic acid, glycolate, 1987[1,3].
Protocatechuic acid, 5 - (carboxymethoxy)-, 1986[9], 1987[3].
$C_9H_8O_8$ Pyrandicarboxylic acid, dihydrohydroxydiketo-(?), di-Me ester, *and salts*, 2860[9], 2861[7].
—, dihydroxyketo-(?), di-Me ester, *and salts*, 2860[9], 2861[7].
—, tetrahydro - 2,4,6 - triketo - (?), di - Me ester, *and salts*, 2860[9], 2861[7].
$C_9H_9AsN_2O_4$ 4 (or 5) - Imidazole - *p* - benzenearsonic acid, 395[5].
$C_9H_9AsN_2O_5$ Benzenearsonic acid, 3,4-malonyldiamino-, 1606[2].
C_9H_9Br Benzene, 1-allyl-4-bromo-, 2666[1].
—, bromoallyl-, 899[1,5], 3155[5].
—, 1-bromo-4-propenyl-, 2666[1].
$C_9H_9BrN_2O_5$ Phenetole, 5 - bromo - 3 - methyl-2,4 - dinitro-, 1223[1].
$C_9H_9BrN_2O_6$ Toluene, 3 - bromo - 2,5 - dimethoxy - 4,6 - dinitro-, 1394[6].
$C_9H_9BrN_2O_7$ Benzene, 1 - bromo - 2,3,4 - trimethoxy - 5,6 - dinitro-, 1609[7].
C_9H_9BrO Indanol, bromo-, 2979[4].
2-Propanone, 1-bromo-3-phenyl-, 1783[7].
$C_9H_9BrO_2$ Acetic acid, bromo-, *p*-tolyl ester, 1237[8].
Acetophenone, bromohydroxymethyl-, 1237[8], 1783[6].
—, *α* - bromo - *p* - methoxy-, 1783[6].
Hydrocinnamic acid, *α*-bromo-, 3280[1].
2,4-Xylic acid, $α^2$-bromo-, 183[9].
$C_9H_9BrO_2S$ Propionic acid, *β* - (*p* - bromophenylmercapto) , 198[3].
$C_9H_9BrO_3$ Benzaldehyde, bromodimethoxy-, 178[8,9].
$C_9H_9BrO_3S$ 2 - Propanone, 1 - (*p* - bromophenylsulfonyl)-, 1625[9], 1626[4].
$C_9H_9BrO_4$ Anisic acid, 5-bromo-2-hydroxy-, Me ester, 3004[5].
$C_9H_9BrO_4S_2$ 1 - Phenol - 2 - sulfonic acid, xanthate, *K salt*, 1797[8].
$C_9H_9BrO_5$ Syringic acid, 2-bromo-, 1225[7].
$C_9H_9Br_2NO$ *m* - Acetotoluide, 2,4 (and 4,6)-dibromo-, 906[2].
Hydrocinnamamide, *α*,*β* - dibromo-, 1612[9].
$C_9H_9Br_2NO_2$ Xylamide, 3,5-dibromohydroxy-, 403[8,9].
$C_9H_9Br_2NO_5$ Benzene, dibromotrimethoxy-6-nitro-, 1609[6,7].
C_9H_9Cl Benzene, *γ*-chloroallyl-, 899[5].
$C_9H_9ClN_2O_2$ Glyoxime, chloro-*p*-tolyl-, 1084[9].
$C_9H_9ClN_2O_3$ Acetotoluide, chloronitro-, 174[9].

$C_9H_9ClN_4O_4$ Acetone, 5-chloro-2,4-dinitrophenylhydrazone, 750^{5}.
$C_9H_9ClO_2$ Benzoic acid, β-chloroethyl ester, 3687^{7}.
m-Cresol, chloro-, acetate, 2842^{1,3}.
Phenol, *p*-chloro-, propionate, 1237^{6}.
Propiophenone, 5-chloro-2-hydroxy-, 1237^{6}.
o-Toluyl chloride, 6-methoxy-, 402^{1}.
$C_9H_9ClO_2S$ Propionic acid, β-(*p*-chlorophenylmercapto)-, 202^{3}.
$C_9H_9ClO_3$ *o*-Veratroyl chloride, 1065^{9}.
$C_9H_9Cl_2N_3O_2$ Acetone, 4,5 - dichloro - 2 - nitrophenylhydrazone, 750^{6}.
$C_9H_9Cl_3O$ Phenethyl alcohol, α - (trichloromethyl)-, 1218^{1}.
$C_9H_9Cl_3OTe$ α - Methylphenacyltellurium trichloride, 414^{1}.
D_2 Aceto
1783^{6}.
$C_9H_9I_2NO_3$ Tyrosine, diiodo-, 3189^{7}.
$C_9H_9Mn_3O_{18}$ + $2H_2O$, 1569^{7}.
C_9H_9N Quinoline, dihydro-, 1082^{9}, 1625^{4}.
C_9H_9NO Anisonitrile, 3-methyl-, 179^{8}.
Chroman, 2-imino-, -*HCl*, 3291^{9}.
Cinnamaldehyde, oxime, 3450^{4}.
Cinnamamide, 1612^{6}.
4(1) - Isoquinolone, 2,3 - dihydro-, 205^{5}.
Melilotonitrile, 3291^{6}.
Oxindole, methyl-, 3456^{2}.
α - Toluic acid, *o* - (aminomethyl)-, lactam, 392^{1}.
$C_9H_9NO_2$ Acetanilide, *m*-formyl-, 1216^{1}.
2 - Furan - α,γ - pentadienaldehyde, oxime, 1235^{7}.
Oxindole, hydroxymethyl-, 3455^{8}.
4(1) - Quinolone, 2,3 - dihydro - 6 - hydroxy-, 205^{9}.
$C_9H_9NO_2S$ Hippuric acid, γ-thio-, 3746^{5}.
$C_9H_9NO_3$ (See also *Hippuric acid.*)
Anthranilic acid, *N*-acetyl-, 1837^{9}.
4 - Chromanone, 7 - hydroxy-, oxime, 606^{1}.
$C_9H_9NO_4$ Acetophenone, 2-hydroxy 5-methyl-3-nitro-, 1237^{5}.
Anisic acid, α-carbamyl-, 1068^{8}.
1,3-Dioxolane, 2 - (*o* - nitrophenyl)-, 749^{4}.
1,3 Dioxolan-2-ol, 2-(*o*-nitrosophenyl)-, 749^{5}.
Glycolamide, *p* - hydroxybenzoate, 1068^{8}.
Salicyluric acid, 231^{9}.
$C_9H_9NO_5$ Benzaldehyde, dimethoxynitro-, 178^{8,9}.
Benzoic acid, 4-ethoxynitro-, 394^{6}, 2833^{8}.
4 - Homopyrocatechol, 6-nitro-, 2-acetate(?), 3449^{7}.
$C_9H_9NO_6$ Gallic acid, carbamylmethyl ester, 1987^{1,3}.
C_9H_9NS Isothiocyanic acid, xylyl ester, 2313^{9}, 2314^{1}.
$C_9H_9N_3$ Imidazole, (aminophenyl)-, *and salts*, 395^{3,4,5,6}.
$C_9H_9N_3O$ 5 - Pyrazolone, 3 - methyl - 1 - (4-pyridyl)-, 1807^{6}.
4(3) - Quinazolone, 3 - amino - 2 - methyl-, 206^{7}.
$C_9H_9N_3O_2$ Imidazole, 4,5 - dihydro - 2 - (*m*-nitrophenyl)-, *and salts*, 2326^{9}.
$C_9H_9N_3O_3S$ Acetyl azide, benzylsulfonyl-, 1409^{6}.
$C_9H_9N_3O_6$ Hydroxylamine, β - (4,6 - dinitro-*o*-tolyl)-, Ac deriv., 2666^{9}.
$C_9H_9N_3O_7$ Tyrosine, 3,5-dinitro-, 1068^{4}.
$C_9H_9N_3O_8$ Homoveratrole, 3,5,6 - trinitro-, 908^{1}.
$C_9H_9N_3O_9$ Benzene, 1,3,5 - trimethoxy - 2,4,6-trinitro-, 2317^{2}.
$C_9H_9N_5O$ 1,2,3,5 - Tetrazole, 4 - acetamido-1-phenyl-, 764^{1}.
$C_9H_9N_5O_7$ Urea, α,β - dimethyl - α - picryl-, 374^{1}.
—, β (2,4 - dinitrophenyl) - α - ethyl - α-nitro-, 589^{9}.
—, β - (2,6 - dinitro - *p* - tolyl) - α - methyl-α-nitro-, 590^{4}.
C_9H_{10} Styrene, methyl-, 1794^{6,7}.
$C_9H_{10}AsCl$ Arsinoline, 1-chloro-1,2,3,4-tetrahydro-, 2839^{5}.
$C_9H_{10}AsNO_8$ Benzenearsonic acid, 4 - carboxyoxy - 3 - nitro-, Et ester, 1984^{8}.
$C_9H_{10}BrNO$ *o*-Acetotoluide, 6-bromo-, 3288^{9}.
Benzaldehyde, 3 - bromo - 4 - dimethylamino-, 1081^{8}.
$C_9H_{10}BrNO_2$ Carbanilic acid, bromo-, ethyl ester, 3164^{5}.
$C_9H_{10}BrNO_3$ Phenetole, 4 - (bromomethyl)-2(and 3)-nitro-, 2833^{7}.
2 - Pyrrolecarboxylic acid, 4 - bromo - 5 - formyl - 3 - methyl-, Et ester, 2160^{3}.
Tyrosine, bromo-, 3366^{4}.
$C_9H_{10}BrNO_4$ Homoveratrole, 5-bromo-3-nitro-, 3449^{8}.
$C_9H_{10}Br_2$ Benzene, (β,γ - dibromopropyl)-, 2485^{2}.
Cumene, β,β′-dibromo-, 385^{6}.
Toluene, *m* - (α,β dibromoethyl)-, 1794^{6}.
$C_9H_{10}Br_2O_3$ Benzene, dibromotrimethoxy, 1609^{6,7}.
$C_9H_{10}Br_4N_2S$ Benzothiazole, 1 - amino 3,5 dimethyl-, tetrabromide, 2858^{5}.
Benzothiazoline, 2 - ethyl - 1 - imino, tetrabromide, 2857^{9}.
$C_9H_{10}ClNO$ Benzoyl chloride, *p*-dimethylamino-, 371^{3}.
$C_9H_{10}ClNO_5$ 1,2 - Dimethylbenzoxazolium perchlorate, 1080^{1}
$C_9H_{10}ClNO_6S$ *o* - Toluenesulfonyl chloride, 4,5-dimethoxy-6-nitro-, 3449^{4}.
$C_9H_{10}FeNO_6$, 1769^{6}.
$C_9H_{10}INO$ 1,2 - Dimethylbenzoxazolium iodide, 1079^{9}.
Propionanilide, α-iodo-, 2978^{2,5}.
$C_9H_{10}INO_2$ Carbanilic acid, iodo-, ethyl ester, 3164^{6}.
$C_9H_{10}NNaO_3$ Veratraldehyde, oxime, Na salt, 3450^{4}.
$C_9H_{10}N_2O_2$ Acetaldehyde, benzoyl-, dioxime, 761^{1}.
1,3,4,2 - Oxdiazin - 2 - one, tetrahydro - 4-phenyl-, 2485^{5}.
3 - Pyrrolecarboxylic acid, 5 - cyano - 4-methyl-, ethyl ester, 3455^{6}.
$C_9H_{10}N_2O_3$ Anisamide, α-carbamyl-, 1068^{8}.
Benzaldehyde, 4 - dimethylamino - 3 - nitro-, 1081^{8}.
Glyoxylohydroxamic acid, *p* - tolyl-, oxime, 746^{6}.
Oxamic acid, *N* - 2 - pyridyl-, Et ester, 2860^{1}.
$C_9H_{10}N_2O_4$ *o* Acetaniside, 6 - nitro-, 2840^{2}.
Benzoic acid, 5 - amino - 2 - nitro-, Et ester, 2672^{4}.
Dipicolinic acid, 4 - dimethylamino-, 1238^{9}.
$C_9H_{10}N_2O_6$ Homoveratrole, 3,5 - dinitro-, 908^{1}, 3449^{4}.
Phenetole, 2 - methoxy - 4,5 - dinitro-, 1608^{1}.
1 - Propanol, 3 - (2,4 - dinitrophenoxy)-, 740^{1}.
$C_9H_{10}N_2S$ Benzothiazole, 1 - amino - 3,5 - dimethyl-, 2858^{6}.

Benzothiazoline, 2 - ethyl - 1 - imino-, 2857[9].

$C_9H_{10}N_2Se$ Aniline, selenocyanodimethyl-, 3288[4].

$C_9H_{10}N_4O$ Isoindazole, 7 - carbamido - 5-methyl-, 2497[9].

$C_9H_{10}N_4O_3$ Biuret, 1 - methyl - 1 - nitroso - 5 - phenyl-, 901[4].
 3 - Pyrrolecarboxylic acid, 4 - methyl - 2- triazoformyl-, ethyl ester, 3455[7].

$C_9H_{10}N_4O_3S$ Glycyl azide, *N* - tolylsulfonyl-, 3298[5].

$C_9H_{10}N_6$ Acetonitrile, *N*, *N′* - methylenebis-[iminobis-, 2980[8].

$C_9H_{10}N_6S$ 1,3,4 - Triazole - 2 - mercaptan, 5- (β-phenylthiocarbamylhydrazino)-, 2162[3].

$C_9H_{10}O$ (See also *Cinnamic alcohol.*)
 Chavicol, 2666[1].
 Hydrocinnamaldehyde, 1396[8].
 Phenol, *p*-propenyl-, 2666[1].
 2 Propanone, 1-phenyl-, 1602[1, 5]

$C_9H_{10}OS$ Acetophenone, 2-mercapto 5-methyl-, 202[8].
 Benzoic acid, thiol-, Et ester, 3694[1]
 —, thiono-, Et ester, 3694[1].

$C_9H_{10}OS_2$ Benzylxanthic acid, Me ester, 1395[9]

$C_9H_{10}O_2$ Acetophenone, methoxy-, 1228[9], 2156[4].
 Benzoic acid, Et ester, 1396[4], 1937[3]
 Hydrocinnamic acid, 3496[1], *Tl salt*, 2818[4]
 Δ[1] - 3 - Pentenone, 1 - (2 - furyl) , 3005[7].
 Phenol, *o* allyloxy-, 1798[1].
 2-Propanone, 1 - hydroxy - 1 - phenyl-, 906[5], 1593[5].
 Propiophenone, α-hydroxy-, 1593[4].
 Pyrocatechol, allyl-, 1798[1, 2].
 α Toluic acid, Me ester, 2456[1]
 2,4 Xylic acid, 183[9].

$C_9H_{10}O_2S$ *m* - Toluic acid, methylmercapto , 199[1], 202[9].

$C_9H_{10}O_3$ Acetophenone, *p* - hydroxy - α - methoxy-, 3297[2].
 Anisic acid, methyl ester, 3712[8]
 Benzaldehyde, 4 - ethoxy - 3 - hydroxy-, 2843[8].
 Mandelic acid, Me ester, 378[1].
 Veratraldehyde, 181[1], 1065[8].
 2,4 - Xylic acid, α[2] (and α[4]) - hydroxy-, 184[1]

$C_9H_{10}O_4$ Acetophenone, 2,4 - dihydroxy - 6- methoxy-, 375[5, 6].
 2,4 - Xylic acid, α[2],α[4] - dihydroxy-, 184[2].

$C_9H_{10}O_4S$ Benzoic acid, *o* - (methylsulfonyl)-, Me ester, 2995[4].

$C_9H_{10}O_5$ Acetic acid, (2,3 - dihydroxyphenoxy) , Me ester, 1987[1].
 Addn. compd., m. 56°, of *p* - cresol and oxalic acid, 47[2].
 Δ[1, 4] - 1,5 - Pentadienedicarboxylic acid, 3- keto-, di-Me ester, 180[8]

$C_9H_{10}S$ Cinnamic mercaptan, 2991[3, 4].
 Thiochroman, 203[9].

$C_9H_{11}AsINO_6$ Carbanilic acid, 5 - arsono - 2 - hydroxy - 3 - iodo-, Et ester, 3289[2].

$C_9H_{11}AsN_4O_4$ 6 - Quinoxalinearsonic acid, 3- amino - 2 - carbamyl - 1,2 - dihydro-, 1606[1].

$C_9H_{11}AsO_4S_2$ Xanthic acid, *p* arsonophenyl ester, 2839[7].

$C_9H_{11}AsO_6$ Benzenearsonic acid, *m*(and *p*)- carboxyoxy-, Et ester, 1984[8].

$C_9H_{11}BrMg$ *p* - Cumenylmagnesium bromide, 1793[3].

$C_9H_{11}BrN_2O_3$ 2 - Pyrrolecarboxylic acid, 4- bromo - 5 - formyl - 3 - methyl , Et ester, oxime, 2160[3].

$C_9H_{11}BrO_2$ Veratrole, 4-(bromomethyl)-, 405[8].

$C_9H_{11}BrO_3$ Benzene, 1 - bromo - 2,3,4 - tri- methoxy-, 1609[7].
 o - Veratryl alcohol, 5 - bromo-, 1792[8].

$C_9H_{11}Cl$ Benzene, chloropropyl-, P 1631[4].
 Mesitylene, chloro-, P 1631[4].

$C_9H_{11}ClN_2O_2$ Carbazic acid, β-phenyl-, β-chloroethyl ester, 2185[5].

$C_9H_{11}ClN_4O_2$ Paraxanthine, 8 - chloro - 3 - ethyl-, 902[1].
 Xanthine, 8 - chloro - 3,7 - diethyl-, 902[2].

$C_9H_{11}ClO$ Ether, γ-chloropropyl phenyl, 3687[7].

$C_9H_{11}ClO_4S$ *o* - Toluenesulfonyl chloride, 4,5- dimethoxy-, 3449[6]

$C_9H_{11}IN_2$ Acetone, (*m* - iodophenyl)hydrazone, 1794[9].

$C_9H_{11}IO$ Phenetole, 2 - iodo - 6 - methyl-, 2832[6]

$C_9H_{11}N$ Ethylamine, *N* - benzal-, *HgCl₂ addn. compd.*, 1610[5].
 1-Indanamine, 755[6].
 Propiolonitrile, cyclohexyl-, 1783[8].

$C_9H_{11}NO$ Acetamide, *N*-benzyl-, 2979[6].
 m-Acetotoluide, 906[1].
 Benzaldehyde, *p* - dimethylamino-, 179[9], 1074[4], 3708[5].
 Hydrocinnamamide, 3163[6].
 Propiophenone, oxime, 1615[1].

$C_9H_{11}NO_2$ Acetanilide, *o* - (hydroxymethyl)-, 1073[5].
 Acetaniside, 2840[6].
 Acetophenone, *p* - methoxy-, oxime, 2324[3].
 Alanine, phenyl-, 56[6], 615[5], 2147[5], 2870[9].
 Anisaldehyde, 3 methyl , oxime, 179[8].
 Anthranilic acid, Et ester, *-HCl*, 403[7].
 —, *N*-methyl-, Me ester, 403[7].
 Benzene, nitropropyl-, P 1631[4].
 Benzocaine, 2108[5]
 Benzoic acid, *p* amino-, Et ester, 2322[7].
 Homopiperonylamine, 1086[6].
 Mesitylene, nitro-, P 1631[4], 2153[4].
 2 - Pyrrolecarboxylic acid, 3,5 - dimethyl-4- vinyl-, 1621[1].
 α - Toluic acid, *o* - (aminomethyl)-, *and -HCl*, 392[1].
 2,4 - Xylaldehyde. 6 - hydroxy-, oxime, 2154[9].

$C_9H_{11}NO_3$ (See also *Tyrosine.*)
 Acetophenone, *ar* - dihydroxy - α - methyl- amino , 242[2], 457[6].
 Anthranilic acid, 5 - methoxy - *N* - methyl-, 207[4].
 Benzaldehyde, 4 - ethoxy - 3 - hydroxy-, oxime, 2843[8].
 Pyrrolecarboxylic acid, formylmethyl-, ethyl ester, 3455[3, 7].
 Serine, β-phenyl-, 593[6], 3450[6].
 Veratraldehyde, oxime, 3450[4].
 o-Veratramide, 1065[9].

$C_9H_{11}NO_4$ Alanine, 3,4 - dihydroxyphenyl-, 53[5].
 Anisole, 2 - (methoxymethyl) - 4(?) - nitro-, 2833[8].
 Benzyl alcohol, 4 - ethoxy - 2(and 3) - nitro-, 2833[7].
 Homoveratrole, 3-nitro-, 908[2].
 Nicotinic acid, 2,4 - dimethoxy-6-methyl-, 915[1].
 Phenetole, methoxynitro-, 1607[9], 1608[7].
 o - Veratric acid, 5 - amino-, 1793[1].

$C_9H_{11}NO_4S$ Toluenesulfonamide, *N*-glycolyl-, 1408[9], 1409[4].

$C_9H_{11}NO_5$ Alanine, β - (3,4,5 - trihydroxy phenyl)-, 1068[1].
 Pyrocatechuic acid, 6 - (β - amino - α - hydroxyethyl)-, *and HCl*, 2331[1].

o-Veratryl alcohol, 5-nitro-, 1792[9].

$C_9H_{11}NS_2$ Carbamic acid, dithio-2,5-xylyl-, *NH_4 salt*, 1080[4].

$C_9H_{11}N_3OS$ Semicarbazide, 1-acetyl-4-phenylthio-, 416[2].

$C_9H_{11}N_3O_2$ Anthranilic acid, β-acetylhydrazide, 206[7].

$C_9H_{11}N_3O_3$ 2-Propanone, 1-hydroxy-, *p*-nitrophenylhydrazone, 2659[8].

$C_9H_{11}N_3O_4$ *m*-Toluidine, *N*-ethyl-2,6(and 4,6)-dinitro-, 173[8].

$C_9H_{11}N_3O_8$ Uracil xyloside, 5-nitro-, 1812[8].

$C_9H_{11}O_2Sb$ Stibine, trimethyl-, dihydroxide, 2482[1].

C_9H_{12} Benzene, propyl-, 173[7].
Hemimellitene, 1601[9].
Mesitylene, 173[7], 1706[3].

$C_9H_{12}AsNO_4$ Arsanilic acid, *N*-propionyl-, 1605[9].

$C_9H_{12}AsNO_5$ *m*-Arsanilic acid, 4-hydroxy-*N*-propionyl-, *and Na salt*, 1985[1].

$C_9H_{12}AsN_3O_5$ Arsanilic acid, *N*-(dicarbamylmethyl)-, 1606[2].

$C_9H_{12}BrNO_2$ 2-Pyrrolecarboxylic acid, 4-bromo-3,5-dimethyl-, Et ester, 2159[9].

$C_9H_{12}Br_4O$ Cyclohexanone, tetrabromo-3,3,5-trimethyl-, 1784[4].

$C_9H_{12}ClN$ Phenethylamine, (chloromethyl)-, *salts*, 391[7,8,9].

$C_9H_{12}INO_2$ 3-Pyrrolecarboxylic acid, 5-iodo-2,4-dimethyl-, Et ester, 597[1].

$C_9H_{12}N_2$ 3-Pyrrolenitrile, 5-ethyl-2,4-dimethyl-, 1236[1].

$C_9H_{12}N_2O$ Hydrocinnamamide, β-amino-, 1066[7].

$C_9H_{12}N_2O_2$ (See also *Dulcin*.)
Aniline, *p*-nitro-*N*-propyl-, 1926[4]
Benzamide, 5-methoxy-2-methylamino-, 207[4].
Benzoic acid, *p*-hydrazino-, Et ester, 1066[8].
Hydrocinnamamide, α-amino-β-hydroxy-β-phenyl-, 3450[8].

$C_9H_{12}N_2O_3$ *o*-Anisidine, *N*,*N*-dimethyl-5-nitro-, 2840[4].
Barbituric acid, 5-allyl-5-ethyl-, 458[7].
3-Pyrrolecarboxylic acid, 5-formyl-4-methyl-, ethyl ester, oxime, 3455[3].

$C_9H_{12}N_2O_3S$ Acetic acid, benzylsulfonyl-, hydrazide, 1409[8].

$C_9H_{12}N_2O_4$ *o*-Toluidine, 4,5-dimethoxy-3-nitro-, *and -HCl*, 3449[7].
o-Tolylamine, 4,5-dimethoxy-3-nitro-, 908[2].

$C_9H_{12}N_2O_4S$ Toluenesulfonic acid, acetaminoamino-, 3448[3].

$C_9H_{12}N_2S$ Urea, α-ethyl-β-phenylthio-, 590[4].
—, thioxylyl-, 2314[1].

$C_9H_{12}N_3O_8Sb$ Stibine, trimethyl-, hydroxypicrate, 2482[1].

$C_9H_{12}N_4O_2$ Anthranilaldehyde, 3-methoxy-, semicarbazone, 402[4].
Paraxanthine, 3-ethyl-, *and perchlorate*, 902[1].
Theobromine, ethyl-, 1795[7].
Xanthine, 3,7-diethyl-, 902[2].

$C_9H_{12}N_4O_2S$ Uric acid, 3-ethyl-1,7-dimethyl-8-thio-, 902[1].

$C_9H_{12}N_4O_3$ Theobromine, methoxymethyl-, 3780[8].

$C_9H_{12}N_6O_7$ Guanidine, α-ethyl-, picrate, 3284[7].

$C_9H_{12}N_6S$ 1,2,5-Triazole, 1,1′-thiocarbonylbis[3,4-dimethyl-, 1810[8].

$C_9H_{12}O$ Australol, 2560[8].
Benzyl alcohol, α,α-dimethyl-, 1602[6].
Cresol, 2,5-dimethyl-, 3315[4].
—, 6-ethyl-, 2154[5,6].
Cumic acid, 3712[8].
Hemimellitenol, 1601[8].
Phenetole, 2-methyl-, 748[9].
Phenol, *p*-isopropyl-, 1793[2].

$C_9H_{12}O_2$ Δ[1]-Cyclohexenecarboxylic acid, 6-(α-hydroxyethyl)-, lactone, 2490[1].
Homoveratrole, 907[9].
3-Pentanone, 1-(2-furyl)-, 3005[2].

$C_9H_{12}O_2S$ *p*-Toluenesulfinic acid, Et ester, 397[2], 3694[1].

$C_9H_{12}O_3$ Benzene, 1,2,4-trimethoxy-, 2849[8].
Cyclohexaneacetic acid, 1-carboxy-, anhydride, 3693[4].
1,2-Propanediol, 3-phenoxy-, 3283[1].
Pyrogallol, 5-propyl-, 1610[6].
Pyromucic acid, Bu and *sec*-Bu esters, 1620[8].

$C_9H_{12}O_3S$ 2,3,4-Hemimellitenesulfonic acid, 1601[9].
p-Toluenesulfonic acid, Et ester, 1784[1].

$C_9H_{12}O_4$ 2-Benzofurancarboxylic acid, octahydro-1-keto-, 1989[4].
Δ[1]-1,3-Cyclohexenedicarboxylic acid, mono-Me ester, 3451[6].

$C_9H_{12}O_5$ 1,1-Cyclopentanediacetic acid, α-keto-, 3155[1].

$C_9H_{12}S$ Sulfide, *o*-ethylphenyl methyl, 193[4], 1804[6].
m-Xylene, methylmercapto, 204[1].

$C_9H_{13}As$ Arsine, benzyldimethyl-, 2839[6].

$C_9H_{13}AsBiNO_7$ Benzenearsonic acid, 3-(β,γ-dihydroxypropylamino)-4-hydroxy, bismuth deriv., *Na salt*, 796[4].

$C_9H_{13}AsN_2O_4$ Benzenearsonic acid, 3-amino-4-propionylamino-, 1605[9].

$C_9H_{13}BrClNO_2$ 2-Tropanecarboxylic acid, 3-bromo-4-chloro-, *and salts*, 1240[8].

$C_9H_{13}BrO$ Isophorone, 2-bromo-, 1784[4].

$C_9H_{13}BrO_4$ 1,3-Propanediol, 2-(α-bromoethylidene)-(?), diacetate, 38[9].

$C_9H_{13}IN_2O_2$ 3-Nitro-*s*-collidinium iodide, 2329[1].

$C_9H_{13}IOTe$ *p*-Anisyldimethyltelluronium iodide, 907[7].

$C_9H_{13}N$ Benzylamine, α-ethyl-, 1615[1].
Cyclooctenenitrile, 2151[1].
Phenethylamine, methyl-, *and derivs.*, 1794[4,5,6]; *-HCl*, 592[9].
Picoline, isopropyl-, *chloroplatinate*, 2501[2].
Pseudocumidine, 3712[8].
Toluidine, *N*,*N*-dimethyl-, 588[1].

$C_9H_{13}NO$ 3,4,5-Hemimellitenol, 2-amino-, 2154[8].
Propiolamide, cyclohexyl-, 1783[9].
3-Pyrrolealdehyde, 5-ethyl-2,4-dimethyl-, 1236[1].

$C_9H_{13}NO_2$ (See also *Epinine*.)
Anhydroecgonine, 2108[5].
3-Pyrrolecarboxylic acid, dimethyl-, Et ester, *$HgCl_2$ deriv.*, 387[9,3].

$C_9H_{13}NO_2S$ 2,3,4-Hemimellitenesulfonamide, 1601[9].
Pseudocumenesulfonamide, 816[7].

$C_9H_{13}NO_3$ See *Adrenaline*.

$C_9H_{13}NS$ Aniline, *p*-(ethylmercapto)-*N*-methyl-, 371[7].

$C_9H_{14}N_2O_2P$ Diazphospholium, *p*-tolyloxy-*P*-oxotetrahydro-, 914[1].

$C_9H_{13}N_3O$ 2 - Indazolecarboxamide, 4,5,6,7-tetrahydro-5-methyl-, 389[2].

$C_9H_{13}N_3O_2S$ Sulfanilic acid, isopropylidenehydrazide, 1409[9].

$C_9H_{13}N_3O_3$ 2,3 - Pyrroledicarboxylic acid, 4-methyl-, 3-ethyl ester, 2-hydrazide, 3455[2].
Tyrosine, 3,5-diamino-, *salts*, 1068[4].

$C_9H_{13}N_3O_3S$ Glycine, *N* - tolylsulfonyl-, hydrazide, 3298[4].

$C_9H_{13}N_3O_4$ Hydrazine, (4,5 - dimethoxy - 3 - nitro-*o*-tolyl)-, 3449[8].

$C_9H_{13}N_3O_5$ 4 - Imidazolecarboxamide, 1 - acetyl - 4 - ethoxytetrahydro - 2,5 - diketo-3-methyl-, 3691[7].

$C_9H_{13}O_2P$ Mesitylenephosphinous acid, 3617[1].

C_9H_{14} Cyclohexane, propargyl-, 3286[9].
Tricyclo[2,2,1,0[2,6]]heptane, 7,7 - dimethyl-, (apocyclene), 3164[9].

$C_9H_{14}AsNO_5$ 3 - Pyrrolecarboxylic acid, 4-arsono - 2,5 - dimethyl-, Et ester, 387[9].

$C_9H_{14}Br_2O$ Cyclohexanone, 2,3 - dibromo-3,5,5 - trimethyl-, 1784[4].

$C_9H_{14}Br_3NO_2$ Ecgonidine, perbromide, 1240[5].

$C_9H_{14}ClN$ Trimethylphenylammonium chloride, 1600[9].

$C_9H_{14}ClN_3O_4$ Glycine, *N* - [*N* - (*N* - chloroacetylglycyl)alanyl]-, 2660[3].

$C_9H_{14}Cl_2O_2Te$ 1,2 - Telluropyran - 3,5(4,6)-dione, 4 - *sec* - butyl-, 1,1 - dichloride, 413[7].
—, 4 - isobutyl-, 1,1 - dichloride, 413[5].
—, 4 - isopropyl - 2 - methyl , 1,1 - dichloride, 413[4].
—, 2 - methyl - 4 - propyl-, 1,1 - dichloride, 413[3].

$C_9H_{14}HgN_2O_5$ Mercuriacetoveronal, 2719[5].

$C_9H_{14}N_2$ Indazole, 4,5,6,7 - tetrahydrodimethyl-, 389[4,7].
1 - Piperidineacetonitrile, *α* -vinyl-, 1053[5].

$C_9H_{14}N_2O$ 3 - Pyrrolealdehyde, 5 - ethyl - 2,4-dimethyl-, oxime, 1236[1].

$C_9H_{14}N_2O_2$ 2,5 - Piperazinedione, 3 - isobutyl-6-methylene-, 2682[4].
Pyrazolecarboxylic acid, 1 - ethylmethyl-, Et ester, 2494[2].
—, 1,3,5 - trimethyl-, Et ester, 2856[9].
2 - Pyrrolecarboxylic acid, 4 - amino - 3,5-dimethyl-, Et ester, *and* -*HCl*, 1236[9].

$C_9H_{14}N_2O_2S$ Hydantoin, ? - acetyl - 5 - isobutyl-2-thio-, 3298[9].

$C_9H_{14}N_2O_3$ Barbituric acid, 5-ethyl-5-isopropyl-, 458[7], 1852[2].
1 - Pentin - 3 - ol, 3,4 - dimethyl , allophanate, 2481[6].
Δ[2] - 1 - Pyrazolinecarboxylic acid, 4 - ethyl-5 - keto - 3 - methyl-, Et ester, 1990[4].
—, 5 - keto - 3,4 - dimethyl-, Pr ester, 1990[4].

$C_9H_{14}N_2O_3S$ Barbituric acid, 5 - (ethoxymethyl)-5-ethyl-2-thio-, 582[1].

$C_9H_{14}N_2O_4$ Barbituric acid, 5 - (ethoxymethyl)-5-ethyl-, 581[9].
—, 5-*β*-hydroxyethyl-5-propyl-, 367[9].

$C_9H_{14}N_2O_5$ 4 - Imidazolecarboxylic acid, 4-ethoxytetrahydro - 2,5 - diketo - 3 - methyl-, Et ester, 3691[4].

$C_9H_{14}N_4O_2$ Guanidine, *α* - (2 - hydroxy - 3 - methyl - Δ[2] - cyclopentenylideneamino) acetate, -*HNO_3*, 2484[9].

$C_9H_{14}N_4O_3$ (See also *Carnosine*.)
Caffeine, methohydroxide, 3190[2].

$C_9H_{14}N_4O_4$ 5 - Pyrimidinecarbamic acid, 6-amino - 1,2,3,4 - tetrahydro - 2,4 - diketo-, Et ester, 901[6].

$C_9H_{14}N_4O_5$ Uric acid, 4,5 - dihydro - 4,5 - dimethoxydimethyl-, 1387[6].
—, 4 (or 5) - ethoxy - 3 - ethyl - 4,5 - dihydro - 5 (or 4) - hydroxy-, 901[8].

$C_9H_{14}O$ Δ[1,α] - Cyclohexaneacetaldehyde, 3-methyl-, 3443[9].
Cyclohexanol, 1 - ethinyl - 3 - methyl-, 3443[9].
Isophorone, 1784[3].
Phorone, 860[3].

$C_9H_{14}O_2$ Cyclohexanone, 2 - (hydroxymethylene)-3,5-dimethyl-, 389[1].
Δ[1] - Cyclohexeneacetic acid, 3-methyl-, 903[7].
Cyclopenteneacetic acid, ethyl ester, 3161[1].

$C_9H_{14}O_2Te$ 1,2 - Telluropyran - 3,5(4,6) - dione, 4-butyl-, 2315[7].
—, 4-*sec*-butyl , 413[7], 2315[7].
—, 4-isobutyl-, 413[5], 2315[7].
—, 4-isopropyl-2-methyl-, 413[4].
—, 2-methyl-4-propyl-, 413[3].

$C_9H_{14}O_3$ Cyclohexaneacetic acid, 3 - keto - 1-methyl-, *and Ag salt*, 172[8].
Δ[1] - Cyclohexenecarboxylic acid, 6 - (*α*-hydroxyethyl)-, 2490[1].

$C_9H_{14}O_4$ Apofenchocamphoric acid, 2490[7].
Citraconic acid, di-Et ester, 1056[3], 2823[8], 3446[4].
1,1 - Cyclopropanedicarboxylic acid, di Et ester, 1056[2].
Itaconic acid, di-Et ester, 1056[3], 2823[8], 3446[4].
Mesaconic acid, di-Et ester, 1056[3].
Δ[2] - 1,4 - Pentenediol, diacetate, 2979[9].
α - Pentenic acid, *α* - ethoxy - *γ* - keto-, Et ester, 3006[2,7].

$C_9H_{14}O_5$ Azelaic acid, *α*-keto-(?), 2831[2].
Glutaric acid, *β*,*β* - diethyl - *α* - keto-, 3155[1].
—, *β* - keto-, di-Et ester, 50[6], 757[9].

$C_9H_{14}O_6$ Acetin, 900[4].
Adipic acid, *β* - carboxymethyl - *β* - methyl-, 172[8]
2,3,4 - Hexanetriol, triformate, 2146[9].
Malic acid, di Et ester, formate, 1056[7].
1,2,4 - Pentanetricarboxylic acid, 4-methyl-, 2490[8].
Propanetricarboxylic acid, tri-Me ester, 1502[3].

$C_9H_{15}Br$ Cyclohexane, *β* - bromoallyl-, 3286[9].

$C_9H_{15}BrN_2O_4$ Asparagine, N^{α} - (*α* - bromoisovaleryl)-, 2310[4].

$C_9H_{15}Cl$ *α* - Fenchocamphoryl chloride, 2846[8].

$C_9H_{15}NO$ Δ[1,α] - Cyclohexaneacetaldehyde, 3-methyl-, oxime, 3443[9].
Ketone, methyl tetrahydro - 1,4 - dimethyl-3-pyridyl, *derivs.*, 1809[4,5].
Trimethylphenylammonium hydroxide, 3747[4].

$C_9H_{15}NO_2$ Nicotinic acid, tetrahydro - 1,4-dimethyl-, Me ester, *and* -*HBr*, 1810[5].

$C_9H_{15}NO_3$ See *Ecgonine*.

$C_9H_{15}NO_5$ Aspartic acid, *N* - formyl-, di-Et ester, 1056[9].

$C_9H_{15}NO_4S$ Succinic acid, (diethylcarbamylmercapto)-, 373[2].
—, (dimethylcarbamylmercapto)-, Et ester, 373[1].

$C_9H_{15}N_3O_3$ Cyclopentanecarboxylic acid, 3-keto-, Et ester, semicarbazone, 2823[8].

$C_9H_{15}N_3O_4$ 4 - Imidazolecarboxamide, 4 - ethoxy-*N* - ethyltetrahydro - 2,5 - diketo - 3-methyl-, 3691[7].
Malonamic acid, *N* - (diaminomethylene)-(ethoxymethylene)-, Et ester, 206[9].

$C_9H_{15}N_3S$ Δ^2 - Cyclohexenone, 3,5 - dimethyl-, thiosemicarbazone, 3161^{2}.
C_9H_{16} Apocamphane, 2846^{7}.
β-Apofenchane, 2846^{7}.
Cyclohexene, 2,3,3 - trimethyl-, 744^{8}.
Cyclooctene, 1-methyl-, 2151^{1}.
Santenane, 2846^{8}.
$C_9H_{16}BrN_3O$ Acetophenone, α - bromohexahydro-, semicarbazone, 1783^{7}.
$C_9H_{16}Br_2O$ Cyclohexanecarbinol, α-(α, β-dibromoethyl)-, 2666^{3}.
$C_9H_{16}MoN_2O_8$ + $1.5H_2O$ Ethylenediamine monogallatomolybdate, 3406^{1}.
$C_9H_{16}N_2$ Fenchocamphorone, hydrazone, 2846^{7}.
1 - Piperidineacetonitrile, α,α - dimethyl, 1053^{6}
Santenone, hydrazone, 2846^{8}.
$C_9H_{16}N_2O$ Ketone, methyl tetrahydro - 1,4 dimethyl - 3 - pyridyl, oxime, 1809^{5}.
Pyrazole, 5 - ethoxy - 3 - methyl - 4 - propyl-, 2855^{7}.
$C_9H_{16}N_2O_2$ Hydantoin, dipropyl-, 2540^{9}.
Piperidone, tetramethylnitroso-, 325^{3}, 3375^{6}.
$C_9H_{16}N_2O_5$ Butyric acid, β - (α - carbethoxyaminoacetamido)-, *and NH_4 salt*, 44^{6}.
Glycine, N - (β - carbomethoxyaminobutyryl)-, Me ester, 44^{5}.
—, N - (γ - carboxyamino - α - hydroxybutylidene)-, di-Me ester, 44^{5}.
α,β - Pseudoureadicarboxylic acid, γ - ethyl, di-Et ester, 2983^{8}.
$C_9H_{16}N_2O_{10}$ *d* - Glucose, 2,3,5 - trimethyl-, 1,6-dinitrate, 742^{6}.
$C_9H_{16}N_4O_3$ 4 - Imidazolecarboxamide, 4 - ethoxy tetrahydro - 2 - keto - N,3 - dimethyl-5 - methylimino-, 3691^{6}.
—, N - ethyltetrahydro - 2 - keto - 3 - methyl-5 - methylimino - 4 - methoxy-, 1388^{1}
$C_9H_{16}N_4O_5$ Glycine, N - [N - (N - glycylglycyl)-alanyl]-, 2660^{3}.
$C_9H_{16}N_6O_2S$ Biacetyl, 2,2′ - thiocarbohydrazone, 3,3′-dioxime, 1810^{8}.
$C_9H_{16}O$ Acetophenone, hexahydromethyl-, 1982^{2}.
Cyclohexanecarbinol, α-vinyl, 2666^{3}.
Cyclononanone, 2150^{7}, 2151^{2}.
Ethylene oxide, 3 - methylcyclohexyl-, 904^{1}
1-Octin-3-ol, 3-methyl-, 2481^{6}.
$C_9H_{16}O_2$ Compd. from tobacco, 967^{5}.
Cyclohexaneacetic acid, 3-methyl-, 903^{9}
Cyclohexanepropionic acid, 3160^{4}.
Cyclooctanecarboxylic acid, 2151^{2}.
2,4 - Hexanedione, 3 - ethyl - 3 - methyl, 413^{4}.
—, 3-isopropyl-, 413^{3}.
—, 3-propyl-, 413^{3}.
2,4 - Pentanedione, 3-*sec*-butyl-, 413^{7}.
—, 3-isobutyl-, 413^{5}.
$C_9H_{16}O_3$ Cyclohexaneacetic acid, α-hydroxy-, Me ester, 378^{4}.
Cyclohexanecarboxylic acid, 2 (α - hydroxyethyl)-, 2490^{3}.
Enanthic acid, γ - keto - α,ϵ - dimethyl, 407^{5}.
$C_9H_{16}O_4$ Adipic acid, mono-Pr ester, 3689^{4}.
Azelaic acid, 301^{6}, 1792^{6}, 2937^{4}.
1,4 - Butanediol, 2 - methyl-, diacetate, 2990^{8}.
Malonic acid, dimethyl-, di Et ester, 1056^{2}.
—, di-Pr ester, 3689^{8}.
—, ethyl-, di-Et ester, 1056^{7}.
5,5′ - Spirobi[*m* - dioxane], 2,2′ - dimethyl, 2109^{1}.
Succinic acid, mono-Am ester, 3689^{6}.
$C_9H_{16}O_5$ Glucosan, 2,3,5 - trimethyl-, 1221^{3}.
Rhamnose, monoacetone-, and isomer, 2827^{4,5}.
$C_9H_{16}O_6$ Azelaic acid, α,η - dihydroxy-, *and di-Ag salt*, 2831^{3}.
Gluconic acid, trimethyl-, lactone, 581^{1}.
Pimelic acid, α,ϵ - dimethoxy-, *and di-Ag salt*, 2830^{9}.
$C_9H_{16}O_7$ Mannoside, acetylmethyl-, 1790^{5}.
$C_9H_{17}Br$ Cyclohexane, bromopropyl-, 3160^{1}.
$C_9H_{17}Cl_2NO_4$ Choline, chloroacetyl-, chloroacetate, 364^{4}.
$C_9H_{17}NO$ Butyraldehyde, β - (1 - piperidyl)-, *chloroaurate*, 1788^{7}.
Conhydrinone, methyl-, 1811^{2}.
Cyclooctanecarboxamide, 2151^{2}.
Isopelletierine, methyl-, 1811^{8}.
Ketone, 1,4 - dimethyl - 3 - piperidyl methyl, *and -HCl*, 1809^{6}.
$C_9H_{17}NO_2$ Ketone, 4 - hydroxy - 1,4 - dimethyl-3 - piperidyl methyl, *and -HCl*, 1809^{4,5}
Nipecotic acid, 1,4 - dimethyl-, Me ester, *-HCl*, 1810^{6}.
$C_9H_{17}NO_3$ Leucine, N - acetyl-, Me ester, 2983^{4}.
Nipecotic acid, 4 - hydroxy - 1,4 - dimethyl-, Me ester, *and -HCl*, 1810^{4}.
$C_9H_{17}N_3O$ Cyclooctanone, semicarbazone, 1792^{8}
$C_9H_{17}N_3O_3$ Acetoacetic acid, α - ethyl-, Et ester, semicarbazone, 1990^{6}.
$C_9H_{17}N_3O_4$ Carbamic acid, [(β - carbamylisopropyl)carbamylmethyl]-, Et ester, 44^{7}
C_9H_{18} Cyclohexane, isopropyl-, 171^{4}.
—, propyl-, 171^{4}
—, trimethyl-, 171^{5,6}.
Cyclopentane, isobutyl-, 171^{3}.
4-Nonene, 3155^{5}.
$C_9H_{18}Br_2$ Nonane, 1,9-dibromo-, 1780^{1}.
$C_9H_{18}INaO_3$ Addn. compd. of acetone and NaI, 2444^{2}.
$C_9H_{18}N_2O$ Ketone, 1,4 - dimethyl - 3 - piperidyl methyl, oxime, 1809^{6}.
$C_9H_{18}N_2O_2$ Ketone, 4 - hydroxy - 1,4 - dimethyl-3 - piperidyl methyl, oxime, *and -HCl*, 1809^{4,5}.
$C_9H_{18}N_2O_3$ 1 - Butanol, 2 - ethyl - 2 - methyl, allophanate, 2481^{4}.
Leucine, N-alanyl-, 3298^{7}.
$C_9H_{18}N_2O_4$ Pimelamide, α,ϵ - dimethoxy-, 2830^{9}.
$C_9H_{18}N_2O_6$ Sarcosinamideglucoside, 2660^{6}.
$C_9H_{18}N_4S$ 2 - Butanone, thiocarbohydrazone, 1811^{2}.
$C_9H_{18}O$ Cyclohexanepropanol, 3159^{9}.
Δ^5 - 2 - Heptenol, 2,6 - dimethyl-, 3086^{9}.
Isovalerone, 800^{4}.
2 - Nonanone, 1792^{7}
Pelargonaldehyde, 2310^{2}
$C_9H_{18}O_2$ 1,2 - Ethanediol, 1 - (3 - methylcyclohexyl)-, 904^{2}.
2 - Nonanone, 3 - hydroxy-, 1786^{9}.
2 - Octanone, 3 - hydroxy - 3 - methyl-, 2481^{8}.
Pelargonic acid, 301^{6}; *Tl salt*, 2818^{1}.
$C_9H_{18}O_3$ 1,2,3 - Propanetriol, 1 - cyclohexyl-, 2666^{3}.
$C_9H_{18}O_5$ Rhamnose, trimethyl-, 1059^{9}.
Xyloside, methyltrimethyl-, 2314^{2}.
$C_9H_{18}O_6$ Glucose, trimethyl-, 170^{9}, 376^{2}, 1221^{3}, 2987^{4,9}.
$C_9H_{18}O_8$ Glycerol, glucoside, 376^{5}.
$C_9H_{19}N$ Cyclooctanemethylamine, 2151^{1}.
Piperidine, 1 - *tert* - butyl-, *and chloroplatinate*, 1053^{7}.
Triethylamine, α - isopropylidene-, *-HCl*, 2820^{9}.

$C_9H_{19}NO$ 1 - Butanol, 3 - (1 - piperidyl)-, *and chloroaurate*, 1788[7].
Caproamide, α - isopropyl-, 405[1].
3 - Piperidinecarbinol, α,1,4 - trimethyl-, 1809[8].
$C_9H_{19}NO_2$ 3 - Piperidinecarbinol, 4 - hydroxy-α,1,4-trimethyl-, 1809[8].
Valine, Bu ester, *-HCl*, 1055[3].
$C_9H_{19}NO_2S$ Thiomorpholine, 4 - amyl-, 1 - dioxide, *and -HCl*, 40[2].
$C_9H_{19}NO_4$ Leucine, monoglyceride, 3283[7].
$C_9H_{19}NS$ Thiomorpholine, 4-amyl-, 40[1].
$C_9H_{19}N_3O$ 2 - Hexanone, 3,3 - dimethyl-, semicarbazone, 2483[1].
2 - Pentanone, 3,3,4 - trimethyl-, semicarbazone, 2483[2].
$C_9H_{19}N_3O_2$ 2-Heptanone, 3-hydroxy-3 methyl, semicarbazone, 2481[7].
2 - Hexanone, 3 - hydroxy 3,5 - dimethyl, semicarbazone, 2481[7]
2 - Octanone, 3-hydroxy, semicarbazone, 1593[1].
C_9H_{20} See *Nonane*.
$C_9H_{20}BrNO_2$ (Carboxymethyl)trimethylammonium bromide, Bu ester, 3688[8].
$C_9H_{20}INO_2$ 1,3 - Dioxolane - 4 - methylamine, N,N,2,2 - tetramethyl-, methiodide, 2816[2].
$C_9H_{20}INO_5$ Galactosyl - 6 - dimethylamine, methiodide, 1597[6].
$C_9H_{20}I_2OS_2$ β - Ketotrimethylenebis[ethylmethylsulfonium iodide], 737[2].
$C_9H_{20}N_2$ Piperidine, 1 - (δ - aminobutyl)-, 117[7]
Pyrrolidine, 1 - (ε - aminoamyl), *and salts*, 417[9].
$C_9H_{20}N_2O_3$ Urea, s - bis(δ - hydroxybutyl), 2980[7]
$C_9H_{20}N_2S$ Urea, s-dibutylthio, 2835[3].
-, s-diisobutylthio, 2835[3]
$C_9H_{20}O_2$ Butanone, methyl, di Et acetal, 2937[7]
Heptanediol, 2,3 dimethyl, 2182[9]
-, 3 ethyl, 1786[3].
Hexanediol, 2,3,5 trimethyl, 2182[9]
-, 4 - ethyl - 2 - methyl, 1786[4]
1,9 Nonanediol, 1789[1].
Pentanone, di Et acetal, 2937[7].
$C_9H_{20}O_2S_2$ Acetone, bis(γ - hydroxypropyl) mercaptole, 737[5].
$C_9H_{20}O_4S_2$ See *Tetronal*.
$C_9H_{20}Se_2$ Pentane, 2,2 - bis(ethylselenyl)-, 1051[5].
$C_9H_{20}Zn$, 2468[1].
$C_9H_{21}Br_2I_6S_4$, 326[8].
$C_9H_{21}ClN_2$ 1,4 - Pentanediamine, N - δ - chlorobutyl-, *salts*, 417[9].
Putrescine, N - ε - chloroamyl-, *di-HCl*, 417[9].
$C_9H_{21}NO$ 2 - Butanol, 3 - diethylamino - 2-methyl-, *and salts*, 2820[8]
Diethylamine, N - (isobutoxymethyl)-, 2300[4].
$C_9H_{21}NO_2$ Butyraldehyde, β - methylamino, di-Et acetal, 1788[5].
$C_9H_{21}N_3$ Guanidine, α,α,γ - triethyl - β,γ - dimethyl-, 374[8].
Piperidine, 1 - {β - [(β - aminoethyl)amino]-ethyl}-, *and di-HCl*, 2862[7].
$C_9H_{21}N_7O_3$ Triethylamine, β,β',β'' - tricarbamido-, 578[2].
$C_9H_{22}Cl_6N_4Pt_2$, 2626[3].
$C_9H_{22}I_2S_2$ Trimethylenebis[ethylmethylsulfonium iodide], 1217[7].
$C_9H_{22}N_2$ Methylenediamine, N,N,N',N'-tetraethyl-, 2300[4].
$C_9H_{22}O_3$ Compd. from tobacco, 967[5].
$C_9H_{24}Br_2CaO_3$, 1746[2].
$C_9H_{24}CaCl_2O_3$, 1746[2].
$C_9H_{24}N_4$ Propylamine, γ,γ',γ'' - triamino-, *salts*, 1589[6].
$C_9H_{24}Sn_2$ Distannane, 1 - triethyl - 2 - trimethyl-, 2977[5].
$C_{10}H_2Br_4O_2$ 1,4 - Naphthoquinone, 2,3,6,7-tetrabromo-, 1803[9].
$C_{10}H_3Br_3O_3$ 1,4 - Naphthoquinone, 2,6,7 - tribromo - 3 - hydroxy-, 1803[9].
$C_{10}H_4Br_2O_2$ 1,4 - Naphthoquinone, 2,3 - dibromo-, 1803[9].
$C_{10}H_4Br_4N_2$ β - Cumidonitrile, α,α,α',α' - tetrabromo-, 379[9].
$C_{10}H_4Br_6O_2$ β - Cumidyl bromide, α,α,α',α'-tetrabromo-, 380[1].
$C_{10}H_4Cl_2O_2$ 1,2 - Naphthoquinone, 3,4 - dichloro-, 3002[1].
$C_{10}H_5Br_3N_2O_2$ Quinaldine, α - tribromonitro, 2862[2,3].
$C_{10}H_5ClN_2O_4$ Naphthalene, 1 - chloro - 2,4 - dinitro-, 750[8].
$C_{10}H_5N_3O_3$ 1,2,5 - Triazole - 3,4 - dicarboxylic anhydride, 1 - phenyl-, 1410[2].
$C_{10}H_5N_3O_4$ 1,2 - Naphthoquinone, 4 - nitro, dioxime peroxide, 2677[1].
$C_{10}H_5N_3O_6$ Naphthalene, 1,4,5 (and 1,3,8)-trinitro-, 2325[4].
$C_{10}H_5N_5O_4$ Naphthalene, 2,4 - dinitro - 1 - triazo-, 2677[1]
$C_{10}H_6Ba_2N_8O_4$ + $3H_2O$ Xanthopterin, Ba deriv., 902[4].
$C_{10}H_6BrNO_2$ Naphthalene, 1 - bromo - 2 - nitro-, 1074[6].
$C_{10}H_6BrNO_4$ 1,2 - Indandione, 4 - bromo - 6,7-methylenedioxy-, 2-oxime, 3292[6].
$C_{10}H_6Br_2N_2$ Cumidonitrile, α,α' - dibromo-, 379[9].
$C_{10}H_6Br_2N_2O_2$ Quinaldine, α,α - dibromo - 8-nitro-, 2862[2].
$C_{10}H_6Br_2N_2O_3$ Barbituric acid, 5,5 - dibromo-1 - phenyl-, 2825[9].
$C_{10}H_6Br_4O_2$ Cumidyl bromide, α,α' - dibromo-, 379[9], 380[1].
$C_{10}H_6Br_4O_4$ β - Cumidic acid, α,α,α',α' - tetrabromo-, 380[1].
$C_{10}H_6ClNO$ Cinchoninyl chloride, *and -HCl*, 3294[6].
$C_{10}H_6ClNO_2$ Naphthalene, 1 - chloro - 2 - nitro-, 1074[6].
$C_{10}H_6Cl_2O_2$ Chromone, 3,6-dichloro-2-methyl-, 1237[8].
$C_{10}H_6Cl_2O_2S$ Thiochromone, 2,2-dichloro-3 hydroxy-6-methyl-, 198[5], 1396[9], 1397[4].
$C_{10}H_6Cl_6O_2$ 2,4 - Xylic acid, α - hexachloro-, Me ester, 184[7].
$C_{10}H_6INO_2$ Naphthalene, 1-iodo-2-nitro-, 1074[6].
$C_{10}H_6N_2O_2$ Pyrocoll, 1337[5].
$C_{10}H_6N_2O_3$ Quinaldaldehyde, 8-nitro-, 2862[2].
$C_{10}H_6N_2O_4$ Naphthalene, dinitro-, 1074[7], 2325[4].
$C_{10}H_6N_2O_{10}S_2$ Naphthalenedisulfonic acid, dinitro-, 3452[6].
$C_{10}H_6N_2S_2$ Quinrhodine, 1626[8].
$C_{10}H_6N_4O_3$ βα - Isonaphthotriazole, 3 - hydroxy-5-nitro-, 750[9].
$C_{10}H_6O_2$ See *Naphthoquinone*.
$C_{10}H_6O_3$ Juglone, 2325[6].
$C_{10}H_6O_3S_2$ 2 - Thiophenecarboxylic anhydride, 2857[4].
$C_{10}H_6O_4$ Furil, 327[1].
Isophthalic acid, 4,6 - bis(hydroxymethyl)-, di-γ-lactone, 380[2].
Naphthazarin, 1077[4].

Terephthalic acid, 2,5 - bis(hydroxymethyl)-, di-γ-lactone, 380[1].
$C_{10}H_6O_5$ Homophthalic anhydride, 3,4 - methylenedioxy-, 3292[6].
$C_{10}H_6O_5S$ 1 - Naphthalenesulfonic acid, 3,4-dihydro - 3,4 - diketo-, 1623[3].
$C_{10}H_6O_6$ Isophthalic acid, 4,6 - diformyl-, 380[3].
Terephthalic acid, 2,5 - diformyl-, 380[3].
$C_{10}H_6O_8$ Benzenetetracarboxylic acid, 3071[2].
$C_{10}H_7Br$ Naphthalene, 1-bromo-, 134[6], 190[7], 1751[9].
$C_{10}H_7BrN_2O_3$ Barbituric acid, 5 - bromo - 1-phenyl-, *and* N_2H_4 *salt*, 2825[9].
$C_{10}H_7BrOS$ Thiochromone, 3 - bromo - 6-methyl-, 198[3,6], 202[7].
$C_{10}H_7BrO_2S$ Thiochromone, 2-bromo-3-hydroxy-6-methyl-, 198[4].
$C_{10}H_7BrO_3$ 1 - Indanone, 4 - bromo - 6,7 - methylenedioxy-, 3292[5].
Pyruvic acid, bromobenzal-, 3164[6].
$C_{10}H_7BrO_3S$ Thiochromone, 3 - broma - 6-methyl-, *S*-dioxide, 198[2].
$C_{10}H_7BrO_4$ Cinnamic acid, 2 - bromo - 4,5-methylenedioxy-, 3292[4].
$C_{10}H_7BrO_6$ Homophthalic acid, 6 - bromo - 3,4-methylenedioxy-, 3292[6].
$C_{10}H_7Br_2N$ Quinaldine, α,α-dibromo-, 2862[1].
$C_{10}H_7Br_2NO_2$ 2,3 - Quinolinedione, 6,8 dibromo-1,4 - dihydro - 1 - methyl-, 2681[6].
$C_{10}H_7Br_2NO_3S_2$ 1,4,2 - Benzothiazin - 3(4) - one, 2,2 - dibromo - 7 - [(carboxymethyl)-mercapto]-, 1993[3].
$C_{10}H_7Br_3OS$ Thiochromone, 3 - bromo - 6 - methyl-, dibromide, 198[7].
$C_{10}H_7Cl$ Naphthalene, chloro-, P 1631[4], 2576[1].
$C_{10}H_7ClHg$ Naphthalene, 1 - (chloromercuri)-, 1767[7,8].
$C_{10}H_7ClN_4O_3$ 1,2,3,5 - Tetrazole, 4 - (5 - chlorosalicylyl)-, acetate-, 3004[7].
$C_{10}H_7ClO_2S$ Thiochromone, 2-chloro-3-hydroxy-6-methyl-, 198[4].
$C_{10}H_7ClO_2$ 3-Benzofuranol, 4-chloro-, acetate, 1237[9].
$C_{10}H_7CuNO_4$ Furoin, oxime, Cu deriv., 1055[6].
$C_{10}H_7IS$ Thiophene, ? - iodo-2-phenyl-, 1079[2].
$C_{10}H_7NO$ Cinchoninaldehyde, P 2167[8].
Cinnamyl cyanide, 2324[3].
Propiolonitrile, cresyl-, 1783[9].
Quinaldaldehyde, 2862[2].
$C_{10}H_7NO_2$ Benzoic acid, *o*-(β-cyanovinyl)-, 2331[4].
Cinnamic acid, *o*-cyano-, 2331[3,4].
Isobenzofuranacetonitrile, 1,2-dihydroketo-, 184[2], 2331[4].
Naphthalene, nitro-, 1074[6], 1232[6], P 1631[4], P 1813[8], 2325[4], 3292[8].
2-Naphthol, 1-nitroso-, 190[8], 1365[2].
$C_{10}H_7NO_2S$ Thiophene, ?-nitro-2(and 3)-phenyl-, 1078[9], 1079[1].
$C_{10}H_7NO_3$ *m*-Coumaric acid, α-cyano-, 3291[9].
Quinaldic acid, *N*-oxide, 1083[4].
—, 1,4-dihydro-4-keto-, 1083[4].
$C_{10}H_7NO_4$ Cinchoninic acid, 2,6-dihydroxy-, 2329[1].
Piperonylic acid, 6-(cyanomethyl)-, 2331[4].
5-Quinolinecarboxylic acid, 2,6(or 3,6)-dihydroxy-, 1083[4].
$C_{10}H_7NO_5S$ 2-Naphthol-6-sulfonic acid, 1-nitroso-, *Na salt*, 3452[8].
$C_{10}H_7N_3O_4$ 1,2,5 - Triazole-3,4-dicarboxylic acid, 1-phenyl-, *and Na salt*, 1410[2].
$C_{10}H_7N_5O$ 1,2,3-Benzotriazole, 1-[4(or 5)-imidazolylformyl]-, 395[1].
$C_{10}H_7OTl$ 1-Naphthol, Tl deriv., 49[7].
$C_{10}H_8$ See *Naphthalene*.
$C_{10}H_8AsN_5O_4$ 1,2,3 - Benzotriazole-5-arsonic acid, 1-[4(or 5) - imidazolylformyl]-, 395[2].
$C_{10}H_8BrN$ Quinaldine, α-bromo-, 2862[2].
$C_{10}H_8BrNO_2$ Hydrocinnamonitrile, 2-bromo-4,5-methylenedioxy-, 2679[9].
$C_{10}H_8BrN_3O$ 1-Pyrazolecarboxamide, 4-bromo-3-phenyl-, 760[7].
$C_{10}H_8Br_2ClNO_2$ Butyryl chloride, β,γ-dibromo-α-keto-γ-phenyl-, oxime, 360[4].
$C_{10}H_8Br_2OS$ 4 - Thiochromanone, 3,3-dibromo-6-methyl-, 197[4], 202[6].
Thiochromone, 6-methyl-, dibromide, 198[6].
$C_{10}H_8Br_2O_2S$ 4 - Thiochromanone, 3,3-dibromo-6-methyl-, *S*-oxide, 199[1].
$C_{10}H_8Br_2O_3$ Cinnamic acid, dibromomethoxy-, 3164[8].
$C_{10}H_8Br_2O_3S$ 4-Thiochromanone, dibromo-6-methyl-, *S*-dioxide, 198[1,2].
$C_{10}H_8Br_2O_4$ Cumidic acid, α,α′-dibromo-, 379[9], 380[1].
$C_{10}H_8Br_6N_2S_2$ *m*-α-Benzobisthiazole, 2,6-dimethyl-, hexabromide, 1806[6].
$C_{10}H_8ClNO_2$ β-Butenyl chloride, α-keto-γ-phenyl-, oxime, 360[4].
2,3 - Quinolinedione, 6-chloro-1,4-dihydro-1-methyl-, 2681[6].
$C_{10}H_8ClNO_3$ Pyruvyl chloride, oxime, Bz deriv., 360[2].
$C_{10}H_8ClN_3O$ 1,2,3 - Triazole-4-carboxylyl chloride, 5-methyl-1-phenyl-, 416[7].
$C_{10}H_8Cl_2O_2$ Malonyl chloride, benzyl-, 1226[3].
$C_{10}H_8Cl_2O_4$ Hydroquinol, 2,3(and 2,5)-dichloro-, diacetate, 1064[9].
$C_{10}H_8Cl_4O_2$ 2,4-Xylic acid, α[2],α[2],α[4],α[4]-tetrachloro-, Me ester, 184[4].
$C_{10}H_8N_2$ Benzenediacetonitrile, 1794[3].
3-Indoleacetonitrile, 759[1].
$C_{10}H_8N_2O$ 1(2) - Quinolinenitrile, 2-hydroxy- (?), 2680[3].
$C_{10}H_8N_2OS_2$ Rhodanine, 5-(anilinomethylene)-, 600[4].
$C_{10}H_8N_2O_2$ Isophthalic acid, 4,6 bis(aminomethyl)-, di γ-lactam, 380[2].
Quinaldine, 5-nitro-, 2862[3].
Terephthalic acid, 2,5-bis(aminomethyl)-, di-γ-lactam, 380[2].
$C_{10}H_8N_2O_2S_2$ 3,7(4,6) - Benzobithiazinedione, 1993[4].
$C_{10}H_8N_2O_3$ Barbituric acid, 1-phenyl-, 2825[9].
1(2) - Phthalazone, 4-hydroxy-, acetate, 381[9].
$C_{10}H_8N_2O_5S_2$ 1,4,2 - Benzothiazin 3(4)-one, 7-[(carboxymethyl)mercapto] - 6 - nitro-, 1993[3].
$C_{10}H_8N_2O_6$ Terephthalic acid, 2,5-diformyl-, dioxime, 380[4].
$C_{10}H_8N_2O_{12}S_2$ Acetic acid, (4,6-dinitro-*m*-phenylenedisulfonyl)bis-, 1993[6].
$C_{10}H_8N_2S_2$ Benzene, (α,β-dithiocyanoethyl)-, 1604[1].
$C_{10}H_8N_4$ 1,2,3-Triazole-4-nitrile, 5-methyl-1-1-phenyl-, 416[9].
$C_{10}H_8N_4O_3$ 4(or 5) - Imidazolecarboxanilide, 2′(and 4′)-nitro-, *and salts*, 394[9], 395[1].
$C_{10}H_8N_4O_8$ Cytosine, picrate, 206[3].
$C_{10}H_8O$ See *Naphthol*.
$C_{10}H_8OS$ 1-Naphthol, 2-mercapto-, 1234[3].
Thiochromone, 6-methyl-, 202[7].
$C_{10}H_8O_2$ 1,2-Naphthalenediol, 383[6], 3656[4].
$C_{10}H_8O_2S$ Thiochromone, 6-methoxy-, 202[7].
1-Thionaphthenealdehyde, 2-hydroxy - 4-methyl-, 202[9].

$C_{10}H_8O_3S$ (See also *Naphthalenesulfonic acid*).
Thiochromone, 6-methyl-, *S*-dioxide, 198[1].
$C_{10}H_8O_4$ Chromone, 3-hydroxy-6(and 8)-methoxy-, 606[2].
Cinnamic acid, *o*-carboxy-, 2331[4].
Esculetin, 4-methyl-, 184[8].
2-Furancarbinol, pyromucate, 1235[3].
Furoin, 327[1].
4 - Isobenzofuranacetic acid, 1,2-dihydro-1-keto-, 184[3].
$C_{10}H_8O_4S$ Naphtholsulfonic acid, P 1813[5]; *Na salt*, 3644[8].
1(and 2) - Naphthylsulfuric acid, *K salt*, 1796[4].
$C_{10}H_8O_5S$ 1 - Thionaphthenecarobxylic acid, 1,2-dihydro-2-keto-(?), *S*-dioxide, Me ester, 2995[5].
—, 2-hydroxy-(?), *S*-dioxide, Me ester, 2995[5].
$C_{10}H_8O_6$ Homophthalic acid, 3,4-methylenedioxy-, 3292[4].
$C_{10}H_8O_6S_2$ Naphthalenedisulfonic acid, *SO_3 addn. compd.*, 2153[9].
$C_{10}H_8O_7S_2$ Naphtholdisulfonic acid, 3644[8].
$C_{10}H_8S$ 2-Naphthyl mercaptan, 2976[6].
$C_{10}H_9AsN_4O_6$ Arsanilic acid, *N*-4(or 5)-imidazolylformyl-3-nitro-, *and salts*, 395[3].
$C_{10}H_9BiO_7$ Glyceric acid, *β*-(o-carboxyphenyl)-, bismuth deriv., *Na salt*, 796[4]
$C_{10}H_9Br$ 1-Butine, 1-bromo-4-phenyl-, 1783[2].
m-Xylene, 4-(bromoethinyl)-, 1783[1].
$C_{10}H_9BrCl_2O_4$ Phenol, 3-bromo-4,5-dichloro-2,6-dimethoxy-, acetate, 1225[7].
$C_{10}H_9BrN_2$ Δ^2-Pyrazoline, 4-bromo-1-methyl-5-phenyl-(?), 759[9].
$C_{10}H_9BrN_4$ Imidazole, (*p*-bromophenylazo)-methyl-, *and -HCl*, 193[9].
$C_{10}H_9BrO$ 1(2)-Naphthalenone, 2-bromo-3,4-dihydro-, 383[3].
$C_{10}H_9BrOS$ 4-Thiochromanone, 3-bromo - 6-methyl-, 197[4], 202[6].
$C_{10}H_9BrO_2S$ 4-Thiochromanone, 3-bromo-6-methoxy-, 202[6].
—, 3-bromo-6-methyl-, *S*-oxide, 199[1].
$C_{10}H_9BrO_3$ Cinnamic acid, bromomethoxy-, 3164[7].
$C_{10}H_9BrO_3S$ 4-Thiochromanone, 3-bromo-6-methyl-, *S*-dioxide, 198[2].
$C_{10}H_9BrO_4$ Hydrocinnamic acid, 2-bromo-4,5-methylenedioxy-, 3292[5].
$C_{10}H_9BrO_4S_2$ Acetic acid, (4-bromo-*o*-phenylenedithio)bis-, 1797[8].
$C_{10}H_9Br_2ClO_4$ Phenol, 4,5-dibromo-3-chloro-2,6-dimethoxy-, acetate, 3694[9].
$C_{10}H_9Br_3O_4$ Phenol, 3,4,5-tribromo-2,6-dimethoxy-, acetate, 2320[4].
$C_{10}H_9ClN_2$ Imidazole, 5-chloro-2-methyl - 1 - phenyl-, 1624[2].
Pyrazole, 4-chloro - 3(or 5) - methyl-5(or 3)-phenyl-, *and -HCl*, 2856[4].
$C_{10}H_9ClN_4O_2$ 1,2,3,5-Tetrazole, 4-(5-chloro-2-methoxybenzoyl)-1-methyl-(?), 3004[7].
$C_{10}H_9ClO_3$ Acetophenone, 5-chloro-2-hydroxy-, acetate, 1237[9].
Mandelyl chloride, acetate, 184[8].
$C_{10}H_9ClO_4$ Benzoyl chloride, 2-(carbomethoxyoxy)-3-methoxy-, 1065[9].
$C_{10}H_9Cl_2HgNO_3$ Acetanilide, 2-(acetoxymercuri)-4,6-dichloro-, 2317[8].
$C_{10}H_9Cl_2NO_2$ Collidinedicarboxylyl chloride, *and $POCl_3$ compd.*, 1226[3,4].
$C_{10}H_9Cl_2N_3O_3$ 1,2,3 - Benzotriazole, 1-(carboxymethoxy) - 5,6 - dichloro-, Et ester, 750[7].
$C_{10}H_9Cl_3O_4$ Phenol, 3,4,5-trichloro-2,6-dimethoxy-, acetate, 2320[4].
$C_{10}H_9Cl_4O_2Sb$ Stibine, (acetylphenacyl)dichloro-, dichloride, 403[1].
$C_{10}H_9I$ 1-Butine, 1-iodo-4-phenyl-, 1783[2].
m-Xylene, 4-iodoethinyl-, 1783[4].
$C_{10}H_9LiO_2 + 2H_2O$ Δ^3 - 2 - Butenone, 4-hydroxy-, Li deriv., 741[1].
$C_{10}H_9N$ (See also *Naphthylamine*).
Lepidine, 327[1], 1991[7].
Quinaldine, 1627[6], 1991[7], 3030[5].
$C_{10}H_9NO$ Cinnamonitrile, methoxy-, *and di-HCl*, 3291[1].
Isoxazole, methylphenyl-, 194[4,8], 1611[5,6].
1-Naphthol, 4-amino-, *-HCl*, 190[8].
Quinaldine, *N*-oxide, 1083[3].
Quinoline, 2-methoxy-, 418[9].
2-Quinolinecarbinol, 2862[2].
Quinolone, methyl-, 418[3], 1083[3].
α-Tolunitrile, *α*-acetyl-, 1216[7].
$C_{10}H_9NOS$ 2(1) - Quinolone, 3-(methylmercapto)-, 1627[3].
$C_{10}H_9NO_2$ Carbamic acid, phenylethinyl-, Me ester, 2157[4].
Hydrocinnamic acid, *o*-cyano-, 2331[4].
3-Indoleacetic acid, 759[2].
Isatin, dimethyl-, 2681[4,6].
Naphthalene, 1,2-dihydro-3-nitro-, 383[1].
1,2 - Naphthoquinone, 3,4-dihydro-, 2 oxime, 383[2].
Propiolamide, cresyl-, 1783[9].
2,3 - Quinolinediol, 8-methyl-, 2681[4].
2(1) - Quinolone, 3-hydroxy-1-methyl-, 2681[5].
Succinimide, *N*-phenyl-, 186[5].
$C_{10}H_9NO_2S$ 2-Benzisothiazolecarboxylic acid, Et ester, *and $AgNO_3$ compd.*, 763[5].
$C_{10}H_9NO_3$ Benzazete, 1-acetyl-1,2-dihydro-2-keto-4-methoxy-, 207[4].
Isobenzofuranacetamide, 1,2 - dihydroketo-, 184[3], 2331[4].
2 - Isoindolineacetic acid, 1-keto-, *NH_4 salt*, 1926[5].
$C_{10}H_9NO_3S$ 2-Naphthalenesulfonic acid, 6-amino-, 1061[7].
$C_{10}H_9NO_4$ 3,4-Chromandione, 6(and 8)-methoxy-, 3-oxime, 606[1,2].
Isatoic anhydride, 5-methoxy - *N* - methyl-, 207[4].
6 - Phenomorpholinecarboxylic acid, 3-keto-, Me ester, 1068[9].
—, 3-keto-4-methyl-, 1068[9].
Piperonal, oxime, Ac deriv., 179[4,5].
$C_{10}H_9NO_4S$ 2-Naphthol-6-sulfonic acid, 1-amino-, *Na salt*, 3452[2].
$C_{10}H_9NO_5$ Isatic acid, *N*-carboxy-, Me ester, 2997[8].
Pyruvic acid, (3,4-methylenedioxyphenyl)-, oxime, 2330[6].
$C_{10}H_9NO_5S_2$ 1,4,2 - Benzothiazin-3(4)-one, 7-[(carboxymethyl)sulfinyl]-, *S*-oxide, 1993[7].
$C_{10}H_9NO_6S_2$ 1,6 - Naphthalenedisulfonic acid, 4-amino-, 1074[8].
$C_{10}H_9NO_7$ Anisic acid, *α*-carboxy-3-nitro-, mono-Me ester, *and Na salt*, 1068[9], 1069[1].
Benzoic acid, 4-carbethoxyoxy-3-nitro-, 394[7].
$C_{10}H_9NO_7S$ Naphtholdisulfonic acid, amino-, 3742[5].
$C_{10}H_9NO_7S_2$ 1,4,2 - Benzothiazin-3-ol, 7-[(carboxymethyl)sulfonyl]-, *S*-dioxide, 1993[3].
$C_{10}H_9NO_{10}S_2$ Acetic acid, (4-nitro-*m*-phenylenedisulfonyl)bis-, 1993[6].
$C_{10}H_9NS$ Thiophenine, ?-phenyl-, *-HCl*, 1078[9].
$C_{10}H_9N_3$ Di-4-pyridylamine, *and salts*, 1238[8].

$C_{10}H_9N_3O$ Propiolaldehyde, β-phenyl-, semicarbazone, 759[6].
1 - Pyrazolecarboxamide, 3(and 5)-phenyl-, 760[5].
1,2,3 - Triazole-4-aldehyde, 5-methyl-1-phenyl-, 416[6].
$C_{10}H_9N_3OS$ 1,3,4 - Thiodiazole, 2-benzamido-5-methyl-, 2161[9].
$C_{10}H_9N_3O_2$ Coumarin, semicarbazone, 3291[9].
Imidazole, 1-methyl-2-(p - nitrophenyl)-, *and salts*, 395[4].
$C_{10}H_9N_3O_3$ 1,2,3 - Benzotriazine-3-carboxylic acid, 3,4-dihydro-4-keto-, Et ester, 382[2].
1,2,4 - Triazol-5-ol, 1-methyl-3-(3,4-methylenedioxyphenyl)-, 914[8].
$C_{10}H_9N_3O_4$ 4 - Imidazolecarboxanilide, tetrahydro-4-hydroxy-2,5-diketo-, 3691[5].
$C_{10}H_9N_3O_5S$ Malonamic acid, N-benzylsulfonyl-α-diazo-, 1409[4].
—, α - diazo-N-p-tolylsulfonyl-, *and salts*, 1408[9], 1409[1].
1,2,3-Triazole-4-carboxylic acid, 1-benzylsulfonyl-5-hydroxy-, 1409[3].
—, 5-hydroxy-1-p-tolylsulfonyl-, 1408[9].
$C_{10}H_9N_3O_9$ Creosol, 3,5,6-trinitro-, acetate, 908[1].
$C_{10}H_9N_5O_2$ 1,2,3 - Triazole - 4,5 - dicarboxamide, 1-phenyl-, 417[1].
$C_{10}H_9NaO_2 + 2H_2O$ Δ^3-2-Butenone, 4-hydroxy-, Na deriv., 741[1].
$C_{10}H_9O_2Tl$ 1,3-Butanedione, 1-phenyl-, Tl deriv., 49[7].
$C_{10}H_{10}$ Butadiene, phenyl-, 2092[3].
1-Butine, 4-phenyl-, 587[8].
Naphthalene, dihydro-, 382[9].
Toluene, propargyl-, 587[8].
m-Xylene, 4-ethinyl-, 1783[1].
$C_{10}H_{10}AsN_3O_4$ Arsanilic acid, N-4(or 5) imidazolylformyl-, and salts, 395[2].
$C_{10}H_{10}BrNO_3$ Hydrocinnamamide, 2-bromo-4,5-methylenedioxy-, 2679[9].
$C_{10}H_{10}BrN_3O$ Cinnamaldehyde, α-bromo, semicarbazone, 759[6].
$C_{10}H_{10}Br_2OS$ 4-Thiochromanone, 6-methyl-, dibromide, 202[4].
$C_{10}H_{10}Br_2O_2$ 2,4-Xylic acid, α^2,α^4-dibromo, Me ester, 184[2].
$C_{10}H_{10}Br_2O_3S$ 2-Propanone, 3 (o-anisylsulfonyl)-1,1-dibromo-, 1625[9].
$C_{10}H_{10}ClHg_2NO_4$ Aniline, 2,4(and 4,5)-bis-(acetoxymercuri)-6(and 2)-chloro-, 589[4, 6].
$C_{10}H_{10}ClNO_3$ Acetanilide, 5-chloro - 2 - hydroxy-, acetate, 194[1].
$C_{10}H_{10}ClNO_4$ p-Toluic acid, α-chloro-3-nitro-, Et ester, 378[9].
$C_{10}H_{10}ClN_3O$ Indazole, 7 - (α-chloroacetamido)-5-methyl-, 2498[1].
$C_{10}H_{10}Cl_3NO_3$ Acetamide, α-trichloro-N-vanillyl-, 404[9].
$C_{10}H_{10}CoMoN_2O_4 + 2H_2O$ Cobalt pyridine molybdate, 1185[1].
$C_{10}H_{10}HgI_3N$ Quinoline, complex salt with MeI and HgI_2, 3695[8].
$C_{10}H_{10}IN$ 1 - Methylquinolinium iodide, 1081[9].
$C_{10}H_{10}N_2$ Imidazole, 1-methyl-2-phenyl, *and salts*, 395[6].
1,8-Naphthylenediamine, 1074[9].
Propiolaldehyde, β-phenyl-, methylhydrazone, 759[9].
Pyrazole, methylphenyl-, 759[9], 2855[8].
$C_{10}H_{10}N_2O$ Imidazole, 5-methoxy-2-phenyl, 1623[8].
3-Indoleacetamide, 759[3].
Isoindazole, 1-acetyl-3-methyl-, 1622[7].
Pyrazolone, methylphenyl-, 2857[6].
Quinazolone, dimethyl-, 207[2, 3].
$C_{10}H_{10}N_2O_2$ Hydantoin, 5-benzyl-, 2010[9].
2-Indazoleacetic acid, α-methyl-, 1622[6].
2-Indazolepropionic acid (?), 1622[6, 7].
Isatin, 4,6-dimethyl-, oxime, 2681[5].
1-Isoindazoleacetic acid, α-methyl-, *and Ag salt*, 1622[7].
1-Isoindazolepropionic acid (?), 1622[6, 7].
Phthalazine, 1,4-dimethoxy-, 185[5].
4(3) - Quinazolone, methoxy-2-methyl-, 207[4, 5].
$C_{10}H_{10}N_2O_2S$ 2 - Benzisothiazolecarbamic acid, Et ester, 763[6].
2 - Oxazolidone, 3-phenylthiocarbamyl-, 2161[1].
$C_{10}H_{10}N_2O_3$ 1(2) - Naphthalenone, 3,4-dihydro 2-nitro, oxime, 383[1].
$C_{10}H_{10}N_2O_4$ o-Quinone, 3,5-diacetamido, 2842[4]
p Tolualdehyde, 3-nitro-, oxime, Ac deriv, 179[8].
$C_{10}H_{10}N_2O_4S$ 3,5-Pyrazoledione, 4 benzylsulfonyl, 1409[5].
$C_{10}H_{10}N_2O_5$ Acetanilide, 2-hydroxynitro-, acetate, 2318[3], 2840[3].
Benzoic acid, o-(β nitroformylethyl)-, 383[3].
$C_{10}H_{10}N_2O_6$ Benzoic acid, 4-acetamido-3-methoxy 2-nitro-, 3458[3].
$C_{10}H_{10}N_2O_7$ Creosol, dinitro-, acetate, 907[9], 908[1], 3449[6].
Isocresol, 4,6-dinitro-, acetate, 3449[5].
$C_{10}H_{10}N_2O_8$ Glycerol, 3,5-dinitrobenzoate, 740[7]
$C_{10}H_{10}N_2O_9S_3$ 2,4,5 - Naphthalenetrisulfonic acid, 1,8-diamino, 1074[7].
$C_{10}H_{10}N_4O$ 4(or 5) - Imidazolecarboxanilide, 2'(and 4') amino, *and salts*, 395[1].
1,2,3 - Triazole 4 - aldehyde, 5-methyl-1-phenyl, oxime, 416[8]
1,2,3 - Triazole - 4 - carboxamide, 5-methyl 1-phenyl, 416[7].
$C_{10}H_{10}N_4O_2$ 1,2,3 - Benzotriaz-4(3)-one, 3 propionylamino-, 207[1].
$C_{10}H_{10}N_4O_3$ Pyrazolecarboxylic anhydride, d methyl-, 2857[1, 2].
$C_{10}H_{10}N_4O_4S$ 1,2,3 Triazole 4 - carboxamide, 1-benzylsulfonyl-5 hydroxy-, 1409[4].
—, 5-hydroxy-p-tolylsulfonyl-, 1409[1].
$C_{10}H_{10}N_4O_5$ 1-Naphthol, 2,4-dinitro-, N_2H_4 *salt*, 750[9].
$C_{10}H_{10}N_4O_6$ Hydroxylamine, β,β' (4,6-dinitro m phenylene)bis, diacetate, 2667[4].
$C_{10}H_{10}N_4S_2$ 1,3,4 - Thiodiazole, 2-methyl-5-β phenylthiocarbamido-, 2161[9].
$C_{10}H_{10}N_6O_7$ Imidazole, 2-amino-4(and 5)-methyl, picrate, 193[9].
$C_{10}H_{10}N_8O_4$ Xanthopterin, 902[9].
$C_{10}H_{10}O$ Benzaldehyde, p-allyl-, 2666[2].
—, p-propenyl, 2666[2].
Δ^3-2-Butenone, 4-phenyl-, 180[8], 1593[9]
1(2) - Naphthalenone, 3,4-dihydro-, 200[8].
$C_{10}H_{10}OS$ 4-Thiochromanone, methyl-, 202[4], 204[2]; *salts*, 201[8, 7].
$C_{10}H_{10}O_2$ Acrylophenone, β-hydroxy p-methyl-, 1590[8].
1,3-Butanedione, 1-phenyl, 3164[1].
Cinnamic acid, Me ester, 1612[8], 2907[3], 3712[9].
Crotonophenone, β-hydroxy-, 3006[1].
Isosafrole, 402[2], 748[9], 2674[7].
1(2) - Naphthalenone, 3,4-dihydro-2-hydroxy, 383[4].
Safrole, 402[2], 2671[1], 2674[7].
$C_{10}H_{10}O_2S$ 4 - Thiochromanone, 6-methoxy-, 202[2].
—, 6-methyl-, S-oxide, 198[9], 202[8].

$C_{10}H_{10}O_3$ Acrylophenone, β-hydroxy-*p*-methoxy-, 1590[8].
1,3-Butanedione, 1-salicyl-, 1236[9].
Butyric acid, α-keto-γ-phenyl-, 56[6].
4-Chromanone, 6(and 8)-methoxy-, 606[1,2].
$C_{10}H_{10}O_3S$ 4 - Thiochromanone, 6-methyl-, *S*-dioxide, 198[2].
$C_{10}H_{10}O_4$ Acetophenone, α,4-dihydroxy-, α-acetate, 3457[6].
Benzofuranone, ethyldihydroxy-, 3163[8].
Hydrocinnamic acid, *o*-carboxy-, 383[1].
Resorcinol, 2,4-diacetyl-, 1237[6].
Succinic acid, phenyl-, 1657[2].
$C_{10}H_{10}O_4S$ *m*-Toluic acid, 6-[(carboxymethyl)-mercapto]-, 1397[4].
$C_{10}H_{10}O_5$ (See also *Opianic acid.*)
Anisic acid, 2-hydroxy-, acetyl deriv., P 2563[9].
Benzoic acid, *p*-carbethoxyoxy-, 394[7].
Propionic acid, β-(β-resorcylyl)-, 2996[1].
$C_{10}H_{10}O_6$ Acetophenone, carboxyoxydihydroxy-, Me ester, 375[7].
Benzoic acid, 2-(carbomethoxyoxy) - 3-methoxy-, 1065[8].
Terephthalic acid, 1798[2].
$C_{10}H_{10}O_8$ Pyran-3,5-dicarboxylic acid, 3,4-dihydro-2,4-diketo - 6 - methoxy-(?), di-Me ester, 2860[9].
—, 2-hydroxy-4-keto-6-methoxy-(?), di-Me ester, 2860[9].
$C_{10}H_{10}S$ 1,2-Benzothiopyran, 4-methyl-, 203[8], 204[1].
$C_{10}H_{11}AsCl_2N_2O_6$ Benzenearsonic acid, 3,4-bis-(α - chloroacetamido)-, 1605[9].
$C_{10}H_{11}AsN_4O_4$ Arsanilic acid, 3-amino-*N*-4(or 5)-imidazolylformyl, *and salts*, 395[3].
$C_{10}H_{11}Br$ Benzene, (γ-bromo-Δ³ butenyl)-, 1054[2], 3286[8].
$C_{10}H_{11}BrO$ Acetophenone, α-bromo-2,4-dimethyl-, 1783[6].
Estragole, β-bromo, 899[5].
$C_{10}H_{11}BrO_2$ 2,4-Xylic acid, α¹(and α³)-bromo-, Me ester, 183[9], 184[1].
$C_{10}H_{11}BrO_4$ Anisic acid, 5 bromo 2-hydroxy-, Et ester, 3004[4].
$C_{10}H_{11}BrO_4S$ 2-Propanone, 1-[*o*(and *p*)-anisylsulfonyl]-3-bromo-, 1625[7,8].
$C_{10}H_{11}Br_3O$ Dicyclopentadiene, dihydroketo, tribromide, 384[6].
$C_{10}H_{11}Cl$ Naphthalene, chlorotetrahydro-, 2935[6].
Styrene, α-chloro-2,4-dimethyl-, 1783[1].
$C_{10}H_{11}ClN_2O_2$ Tetrahydro - 2,5 - diketo-1-pyrrylmethylpyridinium chloride, 365[7].
$C_{10}H_{11}ClN_4O_3$ 2-Propanone, 1-chloro-, 4-(*m*-nitrophenyl)semicarbazone, 175[8].
$C_{10}H_{11}ClO_2$ Acetophenone, 2-chloro-5-methoxy-3-methyl-, 1238[2].
Benzoic acid, γ-chloropropyl ester, 3687[7].
Butyrophenone, 5-chloro-2-hydroxy-, 1237[7].
Phenol, *p*-chloro-, butyrate, 1237[7].
p-Toluyl chloride, α-ethoxy-, 378[9].
$C_{10}H_{11}ClO_3$ Hydrocinnamic acid, α-chloro-β-methoxy-, 2997[8].
$C_{10}H_{11}ClO_3S$ 2-Propanone, 1-chloro-3-*p*-tolylsulfonyl-, 1625[7].
$C_{10}H_{11}Cl_2NO_3$ Acetamide, α,α-dichloro-*N*-vanillyl-, 404[9].
$C_{10}H_{11}Cl_3OTe$ α - Ethylphenacyltellurium trichloride, 414[1].
$C_{10}H_{11}IN_2O$ 2-Acetyl-1-methylindazolium iodide, 1621[9].
1 - Acetyl - 2 - methylisoindazolium iodide, 1621[9].
$C_{10}H_{11}IO$ Acetophenone, α-iodo-2,4-dimethyl-, 1783[6].
$C_{10}H_{11}IO_3S$ 2-Propanone, 1-iodo-3-*p*-tolylsulfonyl-, 1625[7].
$C_{10}H_{11}N$ Aniline, *N*-methyl-*N*-propargyl-, *and -HCl*, 390[1].
Indole, 1-ethyl-, 1625[6].
Quinaldine, 1,2-dihydro-, 2330[7].
$C_{10}H_{11}NO$ Benzoic acid, *o*-(γ-aminopropyl)-, lactam, 392[1].
2-Butanone, 4-imino-3-phenyl-, 1216[7].
Δ³-2-Butenone, 4-amino-4-phenyl-, 1611[6].
4(1) - Quinolone, 2,3-dihydro-5(6, 7 and 8)-methyl-, 205[5,6,7].
α-Toluic acid, *o*-(β-aminoethyl)-, lactam, 392[1].
Tolunitrile, α-ethoxy-, 391[6,7].
$C_{10}H_{11}NOS$ 4 - Thiochromanone, 3-amino-6-methyl-, 202[8].
$C_{10}H_{11}NO_2$ Acetoacetanilide, 368[6].
Benzoic acid, *p*-amino, allyl ester, 2322[7].
Crotonamide, α-hydroxy-γ-phenyl-, 362[7].
Δ² - Cyclohexene-Δ¹,α - acetic acid, α-cyano-3-methyl-, *and salts*, 2832[3].
Diacetanilide, 745[5].
3,4-Dihydro - 6,7 - dihydroxy - 2 - methylisoquinolinium chloride, phenol betaine, 3011[2].
3 - Phenomorpholone, 5,7-dimethyl-, 2498[3].
4(1) - Quinolone, 2,3-dihydro-6-methoxy-, 205[3].
$C_{10}H_{11}NO_3$ β-Alanine, *N*-benzoyl-, 2502[4].
4-Chromanone, 6(and 8)-methoxy-, oxime, 606[1,2].
Tyrosine, *N*-methylene-, *Na salt*, 3283[4].
$C_{10}H_{11}NO_3S$ Saccharin, 1-propyl-, 2327[7].
$C_{10}H_{11}NO_4$ Anisic acid, α-carbamyl-, Me ester, 1068[8].
Carbonilic acid, carboxy-, monoethyl ester, 3164[3].
Isatoic acid, Et ester, 2997[8].
$C_{10}H_{11}NO_5$ Benzaldehyde, 2-ethoxy-3-methoxy-6-nitro-, 179[2].
Creosol, 6-nitro, acetate, 908[1].
Isocreosol, 3-nitro-, acetate (?), 3449[7].
2,4 - Pyrroledicarboxylic acid, 5-formyl-3-methyl-, mono-Et ester, 2160[4].
p-Toluic acid, α-hydroxy-3-nitro-, Et ester, 379[1].
$C_{10}H_{11}NO_6$ Benzoic acid, 2-ethoxy-3-methoxy-6-nitro-, 179[3].
Carbonic acid, Et 3-nitro-*p*-anisyl ester, 1608[7].
$C_{10}H_{11}NO_{10}Th$ Pyridine pentaformatothoriate, 1569[6].
$C_{10}H_{11}NS$ Isothiocyanic acid, 2-mesityl ester, 2314[1].
—, *s*-pseudocumyl ester, 2314[1].
$C_{10}H_{11}NS_2$ Carbamic acid, dithio-, γ-phenylallyl ester, 2991[4].
$C_{10}H_{11}N_3$ 1,2,3-Triazole, 4,5-dimethyl-1-phenyl-, 416[9].
$C_{10}H_{11}N_3O$ Hydrocinnamyl azide, α-methyl-, 592[8].
Indazole, 7-acetamido-5-methyl-, 2496[9].
Isoindazole, 7-acetamido-5-methyl-, 2497[1].
$C_{10}H_{11}N_3OS$ Oxazolidine, 2-imino-3-phenylthiocarbamyl-, 2161[1].
Δ² - Oxazoline, 2-(β-phenylthiocarbamido)-, 2161[1].
$C_{10}H_{11}N_3O_2$ Acetaldehyde, benzoyl-, semicarbazone, 760[5].
Pyruvaldehyde, phenyl-, semicarbazone, 760[3].

1,2,4 - Triazol-5-ol, 3-p-anisyl-1-methyl-, 914[8].
$C_{10}H_{11}N_3O_3$ Piperonal, 2-methylsemicarbazone, 914[8].
$C_{10}H_{11}N_3O_4$ o-Quinone, 3,5-diacetamido-, 1-oxime, 2842[4].
$C_{10}H_{11}N_3O_6$ p-Toluic acid, 3-ethylamino-2,6-dinitro-, 173[9].
$C_{10}H_{11}N_3S$ 1,4,3 - Isothiodiazine, 2-methylamino-5-phenyl-, 415[9], 416[5].
1,3,4,6 - Thiodiazine, 2,3-dihydro-2-imino-3-methyl-5-phenyl-, 415[9].
$C_{10}H_{11}N_5O_2$ 1,2,3,5 - Tetrazole-4-carbamic acid, 1-phenyl-, Et ester, 763[9].
$C_{10}H_{11}N_5O_4S$ 1,2,3 - Triazole - 4 - carboxamide, 1-amino - N - benzylsulfonyl-5-hydroxy-, 1409[4].
—, 1-amino - 5 - hydroxy- N-p-tolylsulfonyl-, 1409[1].
$C_{10}H_{11}N_5O_7$ Urea, β-(dinitrotolyl)-α-ethyl-α-nitro-, 590[2].
$C_{10}H_{12}$ (See also *Tetralin.*)
Dicyclopentadiene, 2148[5].
$C_{10}H_{12}AsClHgN_2O_6$ Benzenearsonic acid, 3,5-diacetamido-2-(chloromercuri) - 4 - hydroxy-, 1607[5].
$C_{10}H_{12}AsIN_2O_6$ Benzenearsonic acid, 3,5-diacetamido-4-hydroxy-2-iodo-, 1607[5].
$C_{10}H_{12}AsNO_6$ m-Arsanilic acid, N-acetyl-4-hydroxy-, acetate, 394[9].
$C_{10}H_{12}AsNO_8$ Benzenearsonic acid, 4-carboxyoxy - 3 - nitro-, isopropyl and Pr esters, 1984[8].
$C_{10}H_{12}BrN$ Aniline, N-β-bromoallyl-N-methyl-, 390[1].
$C_{10}H_{12}BrNO_3$ Acetamide, α-bromo-N-vanillyl-, 404[9].
Acetanilide, 4 - bromo - 2,5 - dimethoxy-, 179[9].
Ether, α-bromo-2-nitro - p - tolyl propyl (?), 2833[8].
$C_{10}H_{12}BrNO_4$ 2-Pyrrolecarboxylic acid, 4-bromo-5-(hydroxymethyl) - 3 - methyl-, Et ester, formate, 2160[2].
$C_{10}H_{12}BrN_3O$ 2-Propanone, 1-bromo-3-phenyl-, semicarbazone, 1783[7].
$C_{10}H_{12}BrN_3O_2$ Acetophenone, α-bromohydroxymethyl-, semicarbazone, 1783[6].
—, α-bromo-p-methoxy-, semicarbazone, 1783[6].
$C_{10}H_{12}Br_2$ Benzene, (β,β'-dibromo-*tert*-butyl)-, 385[4].
Toluene, α-bromo-o-(γ-bromopropyl)-, 905[6].
$C_{10}H_{12}Br_2O$ Dicyclopentadiene, dihydroketo-, dibromide, 384[6].
$C_{10}H_{12}Br_2O_2$ Duroquinone, dibromide, 1984[2].
$C_{10}H_{12}ClNO_2$ Acetaniside, chloro-6-methyl-, 207[5], 2842[2,3].
2,4 - Acetoxylide, α-chloro-6-hydroxy-, 2498[2].
3,4 - Dihydro - 6,7 - dihydroxy-2-methylisoquinolinium chloride, 3011[2].
$C_{10}H_{12}ClNO_3$ Acetamide, α-chloro-N-vanillyl-, 404[9].
3-Pyrrolecarboxylic acid, 5-chloroacetyl-4-methyl-, ethyl ester, 3455[5].
$C_{10}H_{12}INO_3$ Acetamide, α-iodo-N-vanillyl-, 404[9].
$C_{10}H_{12}IN_3O_2$ Acetophenone, hydroxy - α - iodomethyl-, semicarbazone, 1783[6].
$C_{10}H_{12}NO_7P$ 1,3-Propanediol, 2-(hydroxymethyl)-2-nitro-, phenyl cyclophosphate, 2308[2].
$C_{10}H_{12}N_2$ 3-Indoleëthylamine, *and - HCl*, 759[2].
α-Tolunitrile, o-(β - aminoethyl)-, 392[2].
$C_{10}H_{12}N_2O$ Anisaldehyde, azine, 1024[5].
sym-Homotetrahydroisoquinoline, nitroso deriv., 1413[8].
$C_{10}H_{12}N_2O_2$ Acetanilide, α-acetamido-, 1624[1].
1,3 - Butanedione, 1-phenyl-, dioxime, 1611[8].
Carbazic acid, β-(γ - hydroxypropyl)-β-phenyl-, lactone, 2485[5].
Glyoxime, methylphenyl-, mono-Me ether, 746[9].
$C_{10}H_{12}N_2O_3$ (See also *Dial.*)
Hydantoic acid, α-benzyl-, 2010[9].
$C_{10}H_{12}N_2O_3S$ 2 - Benzimidazoleëthanesulfonic acid, α-methyl-, *and salts*, 1979[9]; *Ba salt*, 2482[8].
$C_{10}H_{12}N_2O_4$ o-Acetaniside, methylnitro-, 2840[4], 3458[2].
Durene, dinitro-, 1984[3].
Hydratropic acid, β-methylamino-p-nitro-, *and - HCl*, 1414[2].
2,5 - Piperazinedione, 1,4-diacetyl-3-methyl-6-methylene-, 381[9].
2,5 - Pyrazinediol, 3,6-dihydro-3-methyl-6-methylene-, diacetate, 381[9].
$C_{10}H_{12}N_2O_5$ Acetanilide, 2,5-dimethoxy-4-nitro-, 179[1].
o - Acetotoluide, 4-hydroxy-5-methoxy-3-nitro-, 3449[7].
$C_{10}H_{12}N_2O_6$ Anisole, 4,5-dinitro-2-propoxy-, 1608[2].
—, 2 isopropoxy - 4,5 - dinitro-, 1608[2].
$C_{10}H_{12}N_4$ 1,2,3 - Triazole, 4-(aminomethyl)-5-methyl-1-phenyl-, *- HCl*, 416[8].
$C_{10}H_{12}N_4O_2$ Acetaldehyde, benzoyl-, oxime, semicarbazone, 760[7].
$C_{10}H_{12}N_4O_3S$ Semicarbazide, 4-allyl-1-(o-nitrophenyl)-, 745[8].
$C_{10}H_{12}N_4O_3$ Acetone, 4-(m - nitrophenyl)semicarbazone, 175[6].
Compd., decomps. 250–60°, from N-acetyl-N-methylanthranilic acid, 207[1].
$C_{10}H_{12}O$ (See also *Anethole.*)
Acetophenone, 2,4-dimethyl-, 183[6].
2-Butanone, 3-phenyl-, 2996[7].
Cumaldehyde, 3000[4].
Dicyclopentadiene, dihydroketo-, 384[4].
Dicyclopentadiene oxide, 384[7].
Ether, cyclopropylmethyl phenyl, 390[3].
Ether, ethyl styryl, 2156[9], 3693[7].
Ethylene oxide, α,α-dimethyl-β-phenyl-, 2850[5].
Isobutyrophenone, 2996[7].
Naphthol, tetrahydro-, 1013[2].
$C_{10}H_{12}OS$ Acetophenone, 5-methyl - 2 - (methylmercapto)-, 204[2].
4-Thiochromanol, 4-methyl-, 203[6].
$C_{10}H_{12}OS_2$ Benzylxanthic acid, Et ester, 1395[9].
$C_{10}H_{12}O_2$ (See also *Eugenol.*)
Acetophenone, α-ethoxy-, 2156[8].
—, hydroxydimethyl-, 2154[4,8].
Benzoic acid, isopropyl ester, 580[2].
2 - Butanone, hydroxyphenyl-, 906[4], 3164[1].
4-Chromanol, 4-methyl-, 202[1].
Cumic acid, 1793[4].
Dicyclopentadiene dioxide, 384[7].
Duroquinone, 1984[2], 2320[6].
Hydrosafrole, 402[9].
Isoeugenol, 748[1], 2674[7].
Δ^1-3-Pentenone, 1 - (2-furyl)-2(and 4) methyl-, 3005[2,3].
Propiophenone, p-methoxy-, 1229[1].
Thymoquinone, 750[1], 3290[6].
Tolualdehyde, 5-ethyl-4-hydroxy-, 2154[4,8].
α-Toluic acid, Et ester, 182[2].

Xylenol, acetate, 2154[4,5].
2,4-Xylic acid, Me ester, 183[9].
$C_{10}H_{12}O_2S$ Butyric acid, β-phenylmercapto-, 202[3].
Homoisothiochroman, *S*-dioxide, 906[1].
Propionic acid, α-(*p*-tolylmercapto)-, 3289[5].
Thiochroman, 6-methyl-, *S*-dioxide, 203[8].
$C_{10}H_{12}O_3$ Acetophenone, dimethoxy-, 1065[7], 2321[8].
Anisaldehyde, 2-ethoxy-, 382[6].
Benzaldehyde, 4-ethoxy-2-methoxy-, 382[6].
Creosol, acetate, 907[9].
Ether, ethyl piperonyl, 2330[8].
Isobutyrophenone, 2,4-dihydroxy-, 2320[2].
Isocreosol, acetate, 3449[5].
Lactic acid, β-phenyl-, Me ester, 751[2].
Mandelic acid, Et ester, 378[1], 751[1].
$C_{10}H_{12}O_3S$ Propionic acid, β-(*p*-anisylmercapto)-, 202[3].
—, β-*p*-tolylsulfinyl-, 198[9].
$C_{10}H_{12}O_4$ Carbonic acid, *p*-anisyl Et ester, 1608[7].
Propionic acid, β-anisyloxy-, 606[1,2], 2325[9].
Quinone, 2,5-diethyl-3,6 dihydroxy-, 2842[6].
$C_{10}H_{12}O_4S$ 2-Propanone, 1-(*p*-anisylsulfonyl)-, 419[2].
Propionic acid, β-*p*-tolylsulfonyl-, 198[9].
$C_{10}H_{12}O_5$ Benzoic acid, 3,4,5-trimethoxy-, 3290[8].
Gallic acid, isopropyl ester, 1986[9], 1987[3].
$C_{10}H_{12}O_6S$ 4-Allyl-*o*-anisylsulfuric acid, K *salt*, 1796[2].
$C_{10}H_{12}O_{10}$ Arabinose, dicarbomethoxy-, carbonate, 3285[2].
$C_{10}H_{12}S$ Homoisothiochroman, 906[1].
Thiochroman, 6-methyl-, 203[8,9].
$C_{10}H_{13}AsCl_2$ Arsinoline, 1,2,3,4-tetrahydro-1-methyl-, dichloride, 2839[5].
$C_{10}H_{13}AsO_2S$ Benzoic acid, *p*-(ethylmethylarsyl)-, *As*-sulfide, 363[8].
$C_{10}H_{13}AsO_6$ Benzenearsonic acid, *m*(and *p*)-carboxyoxy-, isopropyl ester, 1984[8]; Pr ester, 1984[8].
$C_{10}H_{13}BrN_4O_3$ 2-Pyrrolecarboxylic acid, 4-bromo-5-formyl-3-methyl-, Et ester, semicarbazone, 2160[9].
$C_{10}H_{13}BrO$ Ether, (bromomethyl)benzyl ethyl, 391[6,8].
Phenethyl alcohol, β-(bromomethyl)-β-methyl-, 385[5].
$C_{10}H_{13}BrO_2$ Δ^3-5,6-Spirodecen-2-one, 6-bromo-4-hydroxy-, 3693[5].
$C_{10}H_{13}BrS_2$ Benzene, 4-bromo-1,2-bis(ethylmercapto)-, 1797[8].
$C_{10}H_{13}Cl$ *p*-Cymene, 7-chloro-, 2487[7].
Durene, chloro-, P 1631[4].
$C_{10}H_{13}ClMg$ *p*-Isopropylbenzylmagnesium chloride, 2487[8].
$C_{10}H_{13}ClN_2$ Pyridine, 2-chloro-3-(tetrahydro-1-methyl-2-pyrryl)-, 2862[9].
$C_{10}H_{13}ClN_2O_2$ Carbazic acid, β-phenyl-, γ-chloropropyl ester, 2485[5].
$C_{10}H_{13}ClN_2O_3$ Barbituric acid, 5-β-chloroallyl-5-isopropyl-, P 970[3].
$C_{10}H_{13}ClO$ Ether, δ-chlorobutyl phenyl, 3687[7].
Phenethyl alcohol, β-(chloromethyl)-β-methyl-, 385[5].
$C_{10}H_{13}LiO_4$ Δ^3-2-Butenone, 4-hydroxy-, Li deriv., dihydrate, 741[1].
$C_{10}H_{13}MoNaO_{11}$ Compd. from di-Et malate and MoO_3, 1594[4].
$C_{10}H_{13}N$ *sym*-Homotetrahydroisoquinoline, *and salts*, 1413[7,8].
Indanamine, *N*-methyl-, 755[9].
Naphthylamine, 5,6,7,8-tetrahydro-, 1627[8,9].
Quinaldine, tetrahydro-, 1626[6].
α-Tolunitrile, 3,4-dihydro-α,5-dimethyl-, 2832[4].
$C_{10}H_{13}NO$ Acetamide, *N*-phenethyl-, 2979[6].
2,3-Acetoxylide, 1602[1].
Butyrophenone, oxime, 1615[1].
Isobutyrophenone, oxime, 1615[1].
α-Toluimidic acid, Et ester, 1218[4].
$C_{10}H_{13}NOS$ Acetanilide, *m*-(ethylmercapto)-, 1063[1].
$C_{10}H_{13}NO_2$ (See also *Phenacetin*.)
o-Acetaniside, *N*-methyl-, 2840[8].
Acetophenone, hydroxydimethyl-, oxime, 2154[4,6].
Anthranilic acid, Pr ester, -*HCl*, 403[7].
—, *N*-methyl-, Et ester, 403[7].
Benzene, 1-*sec*-butyl-4-nitro-, 1983[9].
Benzoic acid, *p*-amino-, Pr and isopropyl esters, 2322[7].
Benzoic acid, *o*-(γ-aminopropyl)-, 392[1].
2 Butanone, 1-hydroxy-1-phenyl-, oxime, 906[5].
Butyric acid, α-amino-γ-phenyl-, 56[6].
Carbamic acid, benzyl-, ethyl ester, 3164[5].
Durene, nitro-, P 1631[4].
Hydrocinnamohydroxamic acid, α-methyl-, 592[8].
3-Pyrroleacrylic acid, 2,4,5-trimethyl-, 1621[1].
α-Toluic acid, α-amino-, Et ester, 2152[8].
α-Toluic acid, (β-aminoethyl)-, 391[9]; *and* -*HCl*, 392[1].
$C_{10}H_{13}NO_2S$ Pyrrolecarboxylic acid, dimethyl-4-thioformyl-, Et ester, 1235[8,9].
$C_{10}H_{13}NO_3$ Alanine, β-methoxy-β-phenyl-, 3450[7].
Carbanilic acid, *o*-hydroxy-, Pr and isopropyl esters, 2319[9].
Damascenine, 403[5].
3-Pyrrolecarboxylic acid, 5-acetyl-4-methyl-, ethyl ester, 3455[4].
Spiro[Δ^2-bicyclopentene-5,1′-cyclohexane]-1,3-diol, 4-nitroso-(?), 3286[6].
Spiro[cyclohexane-1,4′-cyclopentene]-3′,5′-dione, 2′-hydroxy-, 3′-oxime, 3286[6].
p-Toluic acid, 3-amino-α-hydroxy-, Et ester, *and* -*HCl*, 379[1].
$C_{10}H_{13}NO_3S$ Acetanilide, *m*-(ethylsulfonyl)-, 1063[1].
$C_{10}H_{13}NO_4$ Anisole, 2-isopropoxy-4(and 5)-nitro-, 1608[2].
Anisole, nitropropoxy-, 1608[2,3].
2,4-Pyrroledicarboxylic acid, 3,5-dimethyl-, Et ester, 1620[9].
—, 4-methyl-, 2-methyl 3-ethyl ester, 3455[3].
Spiro[Δ^2-bicyclopentene-5,1′-cyclohexane]-1,3-diol, 4-nitro-, 3286[7].
$C_{10}H_{13}NO_4S$ 2-Propanesulfonic acid, 1-phenylcarbamyl-, *and salts*, 1979[6], 2482[7].
2-Propanone, 1-(*p*-anisylsulfonyl)-, oxime, 419[2].
$C_{10}H_{13}NO_5$ Benzyl alcohol, 2-ethoxy-3-methoxy-5-nitro-, 1792[9].
$C_{10}H_{13}N_2O_6P$ 1,3-Propanediol, 2-(hydroxymethyl)-2-nitro-, anilidocyclophosphate, 2308[3].
$C_{10}H_{13}N_3OS$ Acetophenone, 2-mercapto-5-methyl-, semicarbazone, 202[8].
Anisaldehyde, 4-methylthiosemicarbazone, 416[6].
$C_{10}H_{13}N_3O_2$ Acetophenone, 2-hydroxy-4-methyl-, semicarbazone, 2154[4].
—, α-methoxy-, semicarbazone, 2156[4].
Anthranilic acid, β-propionylhydrazide, 207[1].

—, N-acetyl-N-methyl-, hydrazide, 207^{1}.
—, N-methyl-, β-acetylhydrazide, 207^{1}.
Benzamidine, N,N,N'-trimethyl-m-nitro-, *and -HI*, 2326^{8}.
Δ^{1}-3-Pentenone, 1-(2-furyl)-, semicarbazone, 3005^{2}.
$C_{10}H_{13}N_3O_3$ Benzaldehyde, 4-ethoxy-3-hydroxy-, semicarbazone, 2843^{8}.
$C_{10}H_{13}N_3O_4$ m-Toluidine, dinitro-N-propyl-, 173^{6}.
$C_{10}H_{13}N_3S$ Acetone, 4-phenylthiosemicarbazone, 416^{2}.
$C_{10}H_{13}N_5O_4S$ 1,2,3-Triazole-4-carboxamide, 1-benzylsulfonyl-5-hydroxy-, NH_4 deriv., 1409^{4}.
$C_{10}H_{13}NaO_4$ Δ^{3}-2-Butenone, 4-hydroxy-, Na deriv., dihydrate, 741^{1}.
$C_{10}H_{14}$ (See also *Cymene.*)
Benzene, butyl-, 2316^{8}.
—, *sec*-butyl-, 1983^{8}.
Dicyclopentadiene, dihydro-, 2148^{8}.
Durene, 1984^{1}.
Isodurene, 171^{6}.
Verbenene, 1867^{2}.
$C_{10}H_{14}AsNO_5$ m-Arsanilic acid, N-butyryl-4-hydroxy-, *and Na salt*, 1985^{1}.
Carbanilic acid, p-arsono-, Pr ester, 1605^{9}.
$C_{10}H_{14}AsN_3O_4$ 6-Quinoxalinearsonic acid, 1,2-dihydro-3-β-hydroxyethylamino-, 1606^{1}.
$C_{10}H_{14}Br_2$ Dicyclopentadiene, dihydro-, dibromide, 384^{6}.
$C_{10}H_{14}F_3FeN_2O$ + $2H_2O$, 719^{6}.
$C_{10}H_{14}HgN_2O_5$ Barbital, (acetoxymercuri)-, 2719^{6}.
$C_{10}H_{14}N_2$ (See also *Nicotine.*)
Benzamidine, N,N,N'-trimethyl-, *-HNO₃*, 2326^{8}.
Δ^{2}-Pyrazoline, 1,3-dimethyl-5-phenyl-, 761^{9}.
$C_{10}H_{14}N_2O$ (See also *Coramine.*)
Acetamidine, N'-p-phenetyl-, 1218^{6}.
2-Butanone, 4-hydroxy-4-phenyl-, hydrazone, 3164^{1}.
Urea, α-(α-methylphenethyl)-, 592^{6}.
$C_{10}H_{14}N_2O_2$ Phenocoll, 2301^{1}.
$C_{10}H_{14}N_2O_3$ (See also *Allonal.*)
Barbituric acid, 5-allyl-5-propyl-, 458^{7}.
Somnifen, 2209^{1}.
Spiro[cyclohexane-1,4'-cyclopentene]-3',5'-dione, 2'-hydroxy-, dioxime, 3286^{7}.
$C_{10}H_{14}N_2O_3S$ Barbituric acid, 5-ethyl-2-thio-5-β-vinyloxyethyl-, 367^{7}.
$C_{10}H_{14}N_2O_4$ Barbituric acid, 5-ethyl-5-β-vinyloxyethyl-, 367^{6}.
Benzoic acid, 3,4,5-trimethoxy-, hydrazide, 2672^{2}.
Hydrazine, α-(α-methylbenzyl)-, oxalate, 1604^{5}.
2-Pyrrolecarbamic acid, 3-carbethoxy-4-methyl-, methyl ester, 3455^{7}.
$C_{10}H_{14}N_2O_6$ Uracil xyloside, 1-methyl-, 1812^{6}.
$C_{10}H_{14}N_2S$ Urea, 2-mesitylthio-, 2314^{1}.
Urea, s-pseudocumylthio-, 2314^{1}.
$C_{10}H_{14}N_4O_2$ Dipicolinamide, N,N'-dimethyl-4-methylamino-, 1238^{6}.
$C_{10}H_{14}N_4O_3$ Pyrrolecarboxylic acid, formylmethyl-, ethyl ester, semicarbazone, $3455^{3,7}$.
$C_{10}H_{14}N_4O_4S$ 3,5-Pyrazoledione, 4-benzylsulfonyl-, hydrazine deriv., 1409^{5}.
$C_{10}H_{14}N_4O_{10}$ Hydroxylamine, β,β-bis(β-hydroxyethyl)-, picrate, 361^{8}.
$C_{10}H_{14}O$ (See also *Carvacrol; Carvone; Thymol.*)
Anisole, p-isopropyl-, 1793^{8}.
6-Camphenone, 1800^{4}.
Cumic alcohol, 1793^{5}, 2487^{9}.
Dicyclopentadiene, tetrahydroketo-, 384^{5}.
Dicyclopentadiene oxide, dihydro-, 384^{6}.
Phenethyl alcohol, α,α-dimethyl-, 1602^{6}.
3-Tricyclo[2.2.1.$0^{2,6}$]heptanone, 4,7,7-trimethyl-, 1800^{3}.
Verbenone, 1867^{2}.
Xylenol, 6-ethyl-, $2154^{4,5}$.
$C_{10}H_{14}OS$ Ketone, butyl-2-thienyl methyl, $3005^{4,6}$.
1-Propanol, γ-(benzylmercapto)-, 737^{3}.
$C_{10}H_{14}O_2$ Anisole, o-isopropoxy-, 1608^{8}.
Benzene, 1-ethyl-2,4-dimethoxy-, 2849^{1}.
Benzyl alcohol, (ethoxymethyl)-, $391^{6,8}$.
Crocetin, 797^{9}.
Δ^{1}-Cyclohexenecarboxylic acid, 6-(α-hydroxypropyl)-, lactone, 2490^{4}.
Dicyclopentadieneglycol, 384^{7}.
Durohydroquinol, 1084^{3}.
3-Pentanone, 1-(2-furyl)-2-methyl-, 3005^{3}.
1,3-Propanediol, 2-methyl-2-phenyl-, 385^{4}.
Resorcinol, diethyl-, 3163^{7}.
—, 4-isobutyl-, 2320^{3}.
5,6-Spirodecane-1,3-dione, 3693^{5}.
Teresantalic acid, 1227^{4}.
$C_{10}H_{14}O_3$ Propanediol, benzyloxy-, 3688^{3}.
Pyromucic acid, Am ester, 1620^{8}, α-methyl butyl ester, 1620^{9}.
$C_{10}H_{14}O_4$ 1,3-Cyclohexenedicarboxylic acid, di Me ester, $3451^{6,7}$; mono-Et ester, 3451^{6}.
1-Cyclopentacyclobuteneacetic acid, 2-carboxy-2,2_1,3,4,5,5_1-hexahydro, $384^{5,6}$
α,δ-Heptadienic acid, α-hydroxy-γ-keto-ε-methyl, Et ester, 1788^{8}.
1,4-Pyran-2-carboxylic acid, 5,6-dihydro-4-keto-6,6-dimethyl-, Et ester, 1788^{8}.
$C_{10}H_{14}O_5$, 1,1-Cyclohexanediacetic acid, α-keto, 3155^{1}.
4-Pyranbutyric acid, tetrahydro-2,6-diketo-4-methyl-, 172^{6}.
$C_{10}H_{14}O_8$ Hexanetetracarboxylic acid, 3446^{5}
$C_{10}H_{15}As$ Arsine, dimethylphenethyl, 2839^{6}
—, ethylmethyl-p-tolyl-, 363^{8}.
$C_{10}H_{15}BrO$ Camphor, bromo-, 2767^{6}.
$C_{10}H_{15}ClN_2O_6$ Trimethyl-o-nitrobenzylammonium perchlorate, 3288^{8}.
$C_{10}H_{15}ClN_4O_4$ Tetrapeptide from 3,6-dihydro-3-methylene-2,5-pyrazinediol, *-HCl*, 381^{7}
$C_{10}H_{15}ClO$ Epicamphor, 5-chloro-, 2675^{1}.
$C_{10}H_{15}ClO_4$ 1,3-Cyclohexanediol, 2-chloro-, diacetate, 1061^{2}.
$C_{10}H_{15}N$ Aniline, p-*sec*-butyl-, 1983^{9}.
Butyronitrile, cyclohexylidene-, 3447^{6}.
Phenethylamine, dimethyl-, *and derivs.*, 1704^{6}.
2-Picoline, 6-*tert*-butyl-, 3297^{1}.
$C_{10}H_{15}NO$ (See also *Ephedrine; Pseudoephedrine.*)
Benzylamine, (ethoxymethyl)-, *and -HCl*, $391^{6,8}$.
6-Camphenone, oxime, 1800^{4}.
Ketone, ethyl 2-ethyl-4-methyl-3-pyrryl, 1236^{9}.
2-Propanol, 1-anilino-2-methyl-, *and salts*, 2834^{4}.
$C_{10}H_{15}NO_2$ 3-Pyrrolepropionic acid, 2-ethyl-4-methyl-, 1236^{8}.
$C_{10}H_{15}NO_2S$ Aniline, m-(butylsulfonyl)-, *-HCl*, 1063^{1}.
$C_{10}H_{15}NO_3$ Camphor, 3-nitro-, 1072^{9}.
Camphoric anhydride, oxime, 1072^{8}.

Pyrrolecarboxylic acid, (hydroxymethyl)-dimethyl-, Et ester, 1235[8].
$C_{10}H_{15}NO_4S$ Butyric acid, β-sulfo-, $PhNH_2$ salt, 1979[4].
$C_{10}H_{15}NS$ Aniline, *m*-(butylmercapto)-, -*HCl*, 1063[1].
$C_{10}H_{15}N_3O$ 2 - Indazolecarboxamide, 4,5,6,7-tetrahydro-4,6-dimethyl-, 389[8].
$C_{10}H_{15}N_3O_3S$ Alanine, *N*-tolylsulfonyl-, hydrazide, 3298[6].
$C_{10}H_{15}N_3O_5$ 4-Imidazolecarboxamide, 1-acetyl-4-ethoxytetrahydro - 2,5 - diketo-*N*,3-dimethyl-, 3691[7].
Trimethyl - *m*(and *p*) - nitrobenzylammonium nitrate, 3288[8].
$C_{10}H_{15}N_5O_2$ 2,4-Pentanedione, (5-isopropyl-3-*s*-triazolylazo)-, 3294[1].
---, (5-propyl - 3 - *s* - triazolylazo)-, 3294[1].
$C_{10}H_{16}$ (See also *Camphene; Limonene; Nopinene; Octalin; Pinene.*)
Bornylene, 2674[7].
Δ^3-Carene, 407[7].
Cryptotenene, 1070[7], 2490[4].
α-Fenchene, 2674[7].
Naphthalene, octahydro-, 1802[7].
Ocimene, 1987[8], 2975[3].
Phellandrene, 1070[6].
Sylvestrene, 407[7].
Tricyclene, 1227[4].
$C_{10}H_{16}AsI$ Benzyltrimethylarsonium iodide, 2815[8], 2839[6].
$C_{10}H_{16}ClNO$ Epicamphor, 5-chloro-, oxime, 2675[1].
$C_{10}H_{16}Cl_2$ Naphthalene, dichlorodecahydro, 1402[2].
$C_{10}H_{16}Cl_2O_2Te$ 1,2-Telluropyran 3,5(4,6) dione, 4-β-methylbutyl, 1,1-dichloride, 413[7].
$C_{10}H_{16}Cu_4N_{10}$, 3401[1].
$C_{10}H_{16}IN$ 1-Isoamylpyridinium iodide, 3008[8].
Phenethylamine, methyl-, methiodide, 1794[5,6].
$C_{10}H_{16}KNO_9S_2$ + H_2O, Sinigrin, 2148[4].
$C_{10}H_{16}MoN_2O_6$ + nH_2O, 3656[7].
$C_{10}H_{16}N_2$ Indazole, 2 ethyl-4,5,6,7 tetrahydro-5 methyl-, 389[8].
--, 4,5,6,7 - tetrahydro-2,4,6-trimethyl-, 389[8].
Isoindazole, 1-ethyl-4,5,6,7 - tetrahydro-5-methyl-, 389[6].
--, 4,5,6,7 - tetrahydro-1,4,6-trimethyl-, 389[7].
$C_{10}H_{16}N_2O_2$ Camphonanic acid, diazo, methyl ester, 3165[6].
Camphor, pernitroso-, 595[9].
Succinimide, *N*-1-piperidylmethyl-, 365[6].
$C_{10}H_{16}N_2O_3$ (See also *Neonal; Proponal.*)
Benzyltrimethylammonium nitrate, 1603[9], 3288[9].
1-Heptin-3-ol, 3-methyl-, allophanate, 2481[9].
1-Hexin-3-ol, 3,6-dimethyl-, allophanate, 2481[9].
Δ^2 - 1 - Pyrazolinecarboxylic acid, 4-ethyl-5-keto-3-methyl-, Pr ester, 1990[4].
$C_{10}H_{16}N_2O_4$ Barbituric acid, 5-butyl-5-β-hydroxyethyl-, 367[8].
Barbituric acid, 5-ethyl-5-propoxymethyl, 581[9].
Naphthalene, decahydro-4$_1$,8$_1$-dinitro-, 1802[6].
$C_{10}H_{16}N_2O_5$ Barbituric acid, 5,5-bis(ethoxymethyl)-, 581[9].
$C_{10}H_{16}N_4O$ 3-Pyrrolealdehyde, 5-ethyl-2,4-dimethyl-, semicarbazone, 1230[1].
$C_{10}H_{16}N_4O_5$ Uric acid, 4,5-dihydro-4,5-dimethoxy-1,3,7-trimethyl-, 1387[8].
$C_{10}H_{16}N_6O_2$ 2(3) - Imidazolone, 4,4'-hydrazobis[1,3-dimethyl-(?), 2827[1].
$C_{10}H_{16}N_8$ *s*-Triazole, 5,5'-azobis[3-propyl-, 3293[8].
$C_{10}H_{16}O$ (See also *Camphor; Hexetone.*)
2-Butanone, Δ^1-cyclohexenyl-, 3287[4,5].
—, 4-cyclohexylidene-, 3287[7].
Δ^3-2-Butenone, 4-cyclohexyl-, 3287[6].
Carone, 3451[7].
Carvenone, 909[4], 2670[4].
Citral, 1054[5], 3686[9].
Compd., $b_{4.5}$ 99.5–100°, from MeEtCO and mesityl oxide, 3157[4].
Isopulegone, 1614[2], 2670[4].
3-*p*-Menthadienol, 1614[5].
1(2)-Naphthalenone, octahydro-, 1802[7].
Δ^7-4-Octenone, 2-methyl-6-methylene-, 407[6].
Pinocamphane, 1867[2].
Piperitone, 751[7], 2670[4], 3457[7].
Pulegone, 751[3], 1614[2], 3212[3].
Thujone, 1072[5], 1114[4], 2670[4].
$C_{10}H_{16}O_2$ (See also *Ascaridole.*)
Camphor, hydroxy, 2157[5].
Cyclohexanone, 2 - (methoxymethylene)-3,5-dimethyl-, 389[8].
Dicyclopentadieneglycol, dihydro-, 384[6].
$C_{10}H_{16}O_2Te$ 1,2 - Telluropyran-3,5(4,6)-dione, 4-isoamyl, 2315[7].
—, 4 β-methylbutyl-, 413[7].
$C_{10}H_{16}O_3$ Cyclohexaneacetic acid, 1-acetyl-, 3693[4].
Sabinenic acid, 2720[6].
$C_{10}H_{16}O_4$ 1,1 - Cyclobutanedicarboxylic acid, di-Et ester, 1056[2].
Glutaconic acid, β methyl-, di-Et ester, 49[3].
$C_{10}H_{16}O_4S$ Camphorsulfonic acid, 408[2], 2119[7].
$C_{10}H_{16}O_6$ Malic acid, di-Et ester, acetate, 1056[7].
Pimelic acid, β-carboxymethyl-β-methyl-, 172[6].
$C_{10}H_{16}O_7$ Saccharolactone, dimethyl-, Et ester, 2315[7].
$C_{10}H_{16}Sn$ Stannane, benzyltrimethyl-, 2977[6].
$C_{10}H_{17}AsN_2O_3$ Benzenearsonic acid, 3,4-bis-(dimethylamino)-, 1606[2]
$C_{10}H_{17}BrO$ 3-*p*-Menthanone, 8-bromo-, 1614[4].
$C_{10}H_{17}Cl$ Camphane, 2-chloro-, 2999[1].
Naphthalene, chlorodecahydro-, 1402[2].
$C_{10}H_{17}N$ Pyrrole, 2-ethyl-4-methyl-3-propyl-, 1236[5].
$C_{10}H_{17}NO$ Benzyltrimethylammonium hydroxide, 3747[4].
Δ^7 - 4 - Octenone, 2-methyl-6-methylene-, oxime, 407[6].
$C_{10}H_{17}NO_2$ Naphthalene, decahydronitro-, 1802[6].
$C_{10}H_{17}NO_3$ Nipecotic acid, 1-ethyl-4-keto-, Et ester, -*HCl*, 3010[2].
$C_{10}H_{17}NO_3S$ Butanesulfonic acid, aniline salt, 3163[1].
$C_{10}H_{17}NO_5$ Aspartic acid, *N*-acetyl-, di-Et ester, 1056[9]
$C_{10}H_{17}N_3O$ $\Delta^{1,\alpha}$ - Cyclohexaneacetaldehyde, 3-methyl-, semicarbazone, 3443[8].
$C_{10}H_{17}N_3O_3$ Cyclohexaneacetic acid, 3-keto-1-methyl-, semicarbazone, 172[8].
$C_{10}H_{17}N_3S$ Δ^2 - Cyclohexenone, 5-ethyl-3-methyl-, thiosemicarbazone, 3161[2].
$C_{10}H_{18}$ (See also *Decalin.*)
Hydrocarbon from 1-(bromomethyl) - 1,2,2,3-tetramethylcyclopentane, b. 164°, 1399[1].
$C_{10}H_{18}BrNO_2$ Butyric acid, bromoisocaproamido-, 3300[8].
$C_{10}H_{18}Br_2$ *p*-Menthane, dibromo-, 186[9].

$C_{10}H_{18}Cl_2$ *p*-Menthane, dichloro-, 186[9].
$C_{10}H_{18}Cl_2N_4O_4Pt$, 1765[4].
$C_{10}H_{18}Cl_2O_2Te$ Bis(β - ketoamyl)tellurium dichloride, 413[8].
Bis(β - ketoisoamyl)tellurium dichloride, 413[9].
$C_{10}H_{18}Cu_4N_{10}O$, 3401[2].
$C_{10}H_{18}INO$ 3 - Acetyltetrahydro-1,1,4-trimethylpyridinium iodide, 1808[8], 1809[5].
$C_{10}H_{18}INO_2$ 3 - Carboxytetrahydro-1,1,4-trimethylpyridinium iodide, Me ester, 1810[5].
$C_{10}H_{18}N_2$ Isofenchone, hydrazone, 2846[7].
1 - Piperidineacetonitrile, α-ethyl-α-methyl-, 1053[2].
$C_{10}H_{18}N_2O_2$ Menthone, pernitroso-, 1070[9].
$C_{10}H_{18}N_2O_3$ Cyclohexanol, 2,5-dimethyl-, allophanate, 2149[5].
$C_{10}H_{18}N_2O_4$ Acetoacetic acid, α-ethyl-, Et ester, carbomethoxyhydrazone, 1990[4].
$C_{10}H_{18}N_2O_5$ Glycine, *N*-(β - carbomethoxyaminobutyryl)-, Et ester, 44[5].
$C_{10}H_{18}N_4O_2$ 4 - Imidazolecarboxamide, 4-ethoxy - *N* - ethyltetrahydro-2-keto-3-methyl-5-methylimino-, 3691[4].
$C_{10}H_{18}N_6O_2$ Cyclohexanealdehyde, 2-keto-5-methyl-, disemicarbazone, 389[2].
$C_{10}H_{18}O$ (See also *Borneol; Cineole; Citronellal; Geraniol; Isoborneol; Linaloöl; Menthone; Terpineol.*)
Compd., b. 197°, from reduction of 2-methyl-6-methylene - Δ^7 - 4-octenone, 407[6].
Cyclodecanone, 1792[3].
Δ^3-2-Decenone, 1602[3].
Isomenthone, 751[8].
Isopulegol, 2670[4].
$4_1(4)$-Naphthol, octahydro-, 1802[7].
Nerol, 2321[4].
Δ^7-4-Octenone, 2,6-dimethyl-, 407[4].
$C_{10}H_{18}O_2$ 2-Butanone, 4-cyclohexyl-4-hydroxy-, 3287[6].
Cyclohexanebutyric acid, 3160[4].
Cyclohexanecarbinol, α-methyl-, acetate, 3287[2].
Ether, 1,2-epoxycyclohexyl isobutyl, 2665[4].
$\Delta^{8(9)}$-*p*-Menthene-1,2-diol, 2674[7].
2,4-Pentanedione, 3-β-methylbutyl-, 413[7].
$C_{10}H_{18}O_3$ Caprylic acid, η-formyl-, Me ester, 1590[1].
$C_{10}H_{18}O_4$ Adipic acid, mono-Bu ester, 3689[4].
Azelaic acid, mono-Me ester, 1590[3].
Malonic acid, butylisopropyl-, 405[1].
—, isopropyl-, di-Et ester, 1056[2].
—, propyl-, di-Et ester, 1056[2].
Oxalic acid, di-Bu ester, 3689[5].
Sebacic acid, 1396[9], 2150[7], 2937[4].
Succinic acid, di-Pr ester, 3689[8].
—, triethyl-, 1551[7].
$C_{10}H_{18}O_5$ Acetoacetic acid, γ,γ-diethoxy-, Et ester, 388[5].
$C_{10}H_{18}O_6$ Galactonic acid, tetramethyl-, δ-lactone, 1060[4].
Gluconic acid, tetramethyl-, lactone, 581[1], 1060[8].
Suberic acid, α,ζ-dimethoxy-, 2831[1].
$C_{10}H_{18}O_7$ Arabotrimethoxyglutaric acid, di-Me ester, 1059[9].
Glutaric acid, α,β,γ-trimethoxy-, di-Me ester, 3286[5].
Me ester, b_{15} 160°, from tetramethylglucose, 3285[4].
$C_{10}H_{18}O_7S$ Malic acid, di-Et ester, ethanesulfonate, 1056[8].
$C_{10}H_{18}O_9$ *d*-Glucoerythrose, 2988[9].
$C_{10}H_{19}Br$ Cyclohexane, bromobutyl-, 3160[1].
Cyclopentane, 1 - (bromomethyl)-1,2,2,3-tetramethyl-, 1398[9].
1-Decene, 2-bromo-, 1054[2], 3286[9].
$C_{10}H_{19}BrO_6$ Glucoside, trimethylmethyl-, bromohydrin, 376[3].
$C_{10}H_{19}CuNO_2$ 5-Decanone, 6-hydroxy-, oxime, Cu deriv., 1055[6].
$C_{10}H_{19}IO_6$ Glucoside, trimethylmethyl-, iodohydrin, 376[3].
$C_{10}H_{19}N$ $4_1(4)$ - Naphthaleneamine, octahydro-, *and* -*HCl*, 1802[6,7].
$C_{10}H_{19}NO$ (See also *Lupinine.*)
Isomenthone, oxime and isooxime, 751[8].
Menthone, isooxime, 751[9].
Δ^7-4-Octenone, 2,6-dimethyl-, oxime, 407[4].
$C_{10}H_{19}NO_3$ Nipecotic acid, 1-ethyl-4-hydroxy-, Et ester, 3010[2].
Nipecotic acid, 4-hydroxy-1,4-dimethyl-, Et ester, *and* -*HCl*, 1810[4,5].
4 - Piperidinecarboxylic acid, 4-hydroxy-2,2,6,6-tetramethyl-, 2854[6].
$C_{10}H_{19}NO_6S$ Aspartic acid, *N*-(ethylsulfonyl)-, di-Et ester, 1056[9].
$C_{10}H_{19}NO_8$ Glucoside, trimethylmethyl-, 6-nitrate, 742[7].
$C_{10}H_{19}N_3O$ Cyclononanone, semicarbazone, 2150[8].
$C_{10}H_{19}N_3O_3$ Caproic acid, α-isopropyl-δ-ketosemicarbazone, 2846[3].
Enanthic acid, γ-keto-α,ε-dimethyl-, semicarbazone, 407[4].
$C_{10}H_{19}N_9O_4S$ 1,2,3 - Triazole-4-carboxamide, 1-amino - *N* - benzylsulfonyl-5-hydroxy-, dihydrazine salt, 1409[4].
1,2,3 - Triazole - 4 - carboxamide, 1-amino-5-hydroxy - *N* - *p* - tolylsulfonyl-, dihydrazine salt, 1409[1].
$C_{10}H_{20}$ Cyclohexane, butyl-, 739[5].
—, isobutyl-, 171[4].
—, tetramethyl-, 171[7].
Decanaphthene, 816[7].
Hydrocarbon from 1-(bromomethyl)-1,2,2,3-tetramethylcyclopentane, 1399[1].
$C_{10}H_{20}Br_2$ Decane, 1,10-dibromo-, 1789[1].
$C_{10}H_{20}ClNO_2$ 3 - Acetyl - 4 - hydroxy-1,1,4-trimethylpiperidinium chloride, 1809[4,5].
$C_{10}H_{20}Cu_2N_{10}O_{14}$ Compd. from uric acid, 2826[2].
$C_{10}H_{20}INO_2$ 3 - Acetyl-4-hydroxy-1,1,4-trimethylpiperidinium iodide, 1809[4,5].
3 - Carboxy - 1,1,4 - trimethylpiperidinium iodide, Me ester, 1810[6].
$C_{10}H_{20}INO_3$ 3 - Carboxy-4-hydroxy-1,1,4-trimethylpiperidinium iodide, Me ester, 1810[4,5].
$C_{10}H_{20}N_2$ Isovaleraldehyde, azine, 3282[6].
Pentanone, azine, 899[9], 2309[6].
$C_{10}H_{20}N_2O_3$ Butyric acid, γ-leucylamino-, 3300[8].
$C_{10}H_{20}N_2O_4$ Bicarbamic acid, di-Bu ester, 2485[8].
Isobutyric acid, ethylenebis[α-amino-, *Cu salt*, 370[6], 1961[7].
$C_{10}H_{20}N_4O_6$ Bis(trimethylethylene nitrosate), 2315[6].
$C_{10}H_{20}O$ (See also *Citronellol; Menthol.*)
Carvomenthol, 1397[8,9].
Cyclohexanebutanol, 3159[9].
Cyclohexanepropanol, α-methyl-, 739[4].
Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, 1398[9].
2-Decanone, 2150[9].
3-Nonanone, 2-methyl-, 1786[5].
5-Nonenol, 5-methyl-, 1602[4,5].
4-Octanone, 2,6-dimethyl-, 407[4].
Octenol, dimethyl-, 407[4], 3687[1].

Pelargonaldehyde, β-methyl-, 2310[2].
Rhodinol, 263[9].
$C_{10}H_{20}O_2$ (See also *Terpinol.*)
Capric acid, *K salt*, 3617[6]; *Tl salt*, 2818[1].
Caprylic acid, α-ethyl-, 363[1].
Decanone, hydroxy-, 1055[7], 1786[7].
$C_{10}H_{20}O_3$ 2-Butene, 1,1,3-triethoxy-, 3006[7].
Capric acid, α-hydroxy-, *and salts*, 768[2].
Caprylic acid, α-hydroxy-, Et ester, 1786[5].
$C_{10}H_{20}O_5$ Rhamnoside, α-methyltrimethyl-, 1059[8].
$C_{10}H_{20}O_6$ Fructose, tetramethyl-, 3286[3].
Glucose, tetramethyl-, 1221[3], 1789[8], 2987[9], 3447[1].
Glucoside, 2,3,5-trimethylmethyl-, 1221[3], 2310[7].
Mannose, tetramethyl-, 3447[2].
$C_{10}H_{21}BrO$ 1-Decanol, 10-bromo-, 1789[1].
$C_{10}H_{21}N$ Menthylamine, 1086[8].
Piperidine, 1-*tert*-amyl-, 1053[8].
$C_{10}H_{21}NO$ Cyclohexanol, 2-diethylamino-, 2831[6].
3-Hexanone, 1-diethylamino-, 1217[3].
4-Octanone, 2,6-dimethyl-, oxime, 407[5].
$C_{10}H_{21}NO_2$ Leucine, Bu and isobutyl esters, *-HCl*, 1055[8].
$C_{10}H_{21}NO_4$ Diisobutylamine, oxalate, 900[1].
$C_{10}H_{21}N_3O$ Isovalerone, semicarbazone, 860[4].
2-Nonanone, semicarbazone, 1792[7].
$C_{10}H_{21}N_3O_2$ 2-Nonanone, 3-hydroxy-, semicarbazone, 1786[6].
2-Octanone, 3-hydroxy-3-methyl-, semicarbazone, 2481[8].
$C_{10}H_{22}$ Octane, 2,7-dimethyl-, 3383[9].
$C_{10}H_{22}BrNO_2$ α-Carboxybutyltrimethylammonium bromide, Et ester, 3688[8].
$C_{10}H_{22}INO$ 1-(γ-Hydroxy-α-methylpropyl)-1-methylpiperidinium iodide, 1788[7].
$C_{10}H_{22}INO_2$ 4-Hydroxy-3-α-hydroxyethyl 1,1,4-trimethylpiperidinium iodide, 1809[6].
$C_{10}H_{22}N_2$ Piperidine, 1-(ε-aminoamyl)-, 417[9].
$C_{10}H_{22}O$ Ether, bis(α-methylbutyl), 361[8].
—, ethyl α-methylheptyl, 397[9].
Isoamyl ether, 361[9].
5-Nonanol, 5-methyl-, 1602[6].
4-Octanol, 2,6-dimethyl-, 407[5].
— 4-ethyl-, 1602[6].
$C_{10}H_{22}O_2$ 1,10-Decanediol, 1789[1].
3,4-Heptanediol, 3-ethyl-6-methyl-, 1786[4].
Hexanone, di-Et acetal, 2937[7].
2,3-Nonanediol, 2-methyl-, 1786[5].
2,3-Octanediol, 2,3-dimethyl-, 2482[9].
Pentanone, methyl-, di-Et acetal, 2937[7].
$C_{10}H_{22}O_2S_2$ 2-Butanone, bis(γ-hydroxypropyl) mercaptole, 737[4].
$C_{10}H_{22}O_4$ Glyoxal, tetra-Et acetal, 2821[3].
$C_{10}H_{22}S$ Isoamyl sulfide, 278[8].
$C_{10}H_{23}N$ Butylamine, *N*,*N*-diethyl-α,α-dimethyl-, *and salts*, 3280[4].
Diamylamine, *-HCl*, 1216[8].
$C_{10}H_{23}NO_2$ Butyraldehyde, β-dimethylamino-, di-Et acetal, 1788[8].
$C_{10}H_{24}BrN$ Butyltriethylammonium bromide, 3688[8].
$C_{10}H_{24}Cl_2N_2$ 1,1,2,4,4,5-Hexamethylpiperazinium dichloride, *and HgCl₂ compd.*, 398[6].
$C_{10}H_{24}Cl_2N_4O_8S_2$ Dehydrobis[*N*, *N*, *N'*, *N'*-tetramethylthiuronium perchlorate], 374[1].
$C_{10}H_{24}Cl_4N_4Pt_2$, 2626[3].
$C_{10}H_{24}IN$ Butyltriethylammonium iodide, 3688[6].
$C_{10}H_{24}IN_3$ α,α,β-Triethyl-β,γ,γ-trimethylguanidinium iodide, 374[9].
$C_{10}H_{24}I_2N_2$ 1,1,2,4,4,5-Hexamethylpiperazinium diiodide, 398[8].
$C_{10}H_{24}I_3N_3$ α,α,β-Triethyl-β,γ,γ-trimethylguanidinium triiodide, 374[9].
$C_{10}H_{24}N_2$ 2,3-Butanediamine, *N*, *N*, *N'*, *N'*,2,3-hexamethyl-, 1053[7].
$C_{10}H_{24}N_2O_8$ 2-Butanol, 1-hydroxamino-, oxalate, 1052[3].
$C_{10}H_{25}CoN_6O_3S$, 2924[3].
$C_{10}H_{25}NO$ Butyltriethylammonium hydroxide, 3747[4].
$C_{10}H_{26}Cl_2N_2OS$ β,β'-Sulfinylbis[ethyltrimethylammonium chloride], 40[4].
$C_{10}H_{26}Cl_2N_2O_2S$ β,β'-Sulfonylbis[ethyltrimethylammonium chloride], 40[4].
$C_{10}H_{26}Cl_2N_2S$ β,β' - Thiobis[ethyltrimethylammonium chloride], 40[3].
$C_{10}H_{26}Cl_6N_2OPtS$ β,β' - Sulfinylbis[ethyltrimethylammonium] chloroplatinate, 40[4].
$C_{10}H_{26}Cl_6N_2O_2PtS$ β,β' - Sulfonylbis[ethyltrimethylammonium] chloroplatinate, 40[4].
$C_{10}H_{26}Cl_6N_2PtS$ β,β' - Thiobis[ethyltrimethylammonium] chloroplatinate, 40[3].
$C_{10}H_{26}N_2O_2$ 1,1,2,4,4,5-Hexamethylpiperazinium dihydroxide, 398[6].
$C_{10}H_{26}N_4$ See *Spermine.*
$C_{11}H_5Ag_2FeN_6O$, 1769[9].
$C_{11}H_5FeN_6Na_3O$, 1769[9].
$C_{11}H_6AgNO$ 2-Naphthonitrile, 3-hydroxy-, Ag deriv., 910[9].
$C_{11}H_6BrN$ Naphthonitrile, 5-bromo-, 1216[4,5].
$C_{11}H_6BrNO_4$ Cinnamic acid, 2-bromo-α-cyano-4,5-methylenedioxy-, 2679[8].
$C_{11}H_6Br_2O_3$ 2-Naphthoic acid, 4,7-dibromo-3-hydroxy-, 1616[6].
$C_{11}H_6Cl_2O_2$ 2-Naphthoyl chloride, 4-chloro-3-hydroxy-, 1616[4].
$C_{11}H_6Cl_3N_3O_5$ Phenol, 2,4,6-trichloro-3,5-dinitro-, pyridine salt, 1609[8].
$C_{11}H_6KNO$ 2-Naphthonitrile, 3-hydroxy-, K deriv., 910[9].
$C_{11}H_6N_2O_2$ Naphthonitrile, nitro-, 1216[3].
$C_{11}H_6N_2O_3$ β-Naphthoxdiazolecarboxylic acid, 1233[6,7].
$C_{11}H_6N_2O_5$ 1-Naphthaldehyde, 2,4-dinitro-, 2325[4].
$C_{11}H_7BrClNO_3$ 2,3-Quinolinediol, 6-bromo-5-chloro-, 2681[4].
$C_{11}H_7BrKNO_2$ 2-Naphthamide, 4-bromo-3-hydroxy-, K deriv., 910[9].
$C_{11}H_7BrO$ Naphthaldehyde, bromo-, 1210[4,5].
$C_{11}H_7BrO_3$ 1-Naphthoic acid, 4-bromo-3-hydroxy-, 1233[4].
$C_{11}H_7Br_2NO_3$ 3-Tricycloindolepropionic acid, 4,6-dibromo-2,3-dihydro-2 keto-, 1989[5].
$C_{11}H_7Br_2N_3$ Pyridine, 4-(2,4-dibromophenylazo)-, 1808[3].
$C_{11}H_7Cl_2N_3$ Pyridine, 4-(2,4-dichlorophenylazo)-, 1807[8].
$C_{11}H_7I_2NO_3$ 3-Tricycloindolepropionic acid, 2,3-dihydro-4,6-diiodo-2-keto-, 1989[7].
$C_{11}H_7NO$ Isocyanic acid, 1-naphthyl ester, 1232[8], 2319[3].
Naphthonitrile, hydroxy-, 910[5], 2322[5].
$C_{11}H_7NOS$ Benzothiazole, 1-(2-furyl)-, 386[7], 600[2].
1-Naphthol, 4-thiocyano-, 1603[9], P 2167[4].
$C_{11}H_7NO_2$ Isocyanic acid, 3-hydroxy-2-naphthyl ester, 1616[5].
$C_{11}H_7NO_3S$ 1-Naphthalenesulfonic acid, 4-cyano-, *Na salt*, 1216[2].
$C_{11}H_7NO_4$ Naphthoic acid, 3,4-dihydro-3,4-diketo-, oxime, 1233[6].
—, 3-hydroxy-4-nitroso-, 1233[6].
—, 6(and 7)-nitro-, 1075[2].
$C_{11}H_7NS_2$ Benzothiazole, 1-(2-thienyl)-, 600[8].

$C_{11}H_7N_3O$ 5-Pyrimidinenitrile, 1,4 dihydro-4-keto-2-phenyl-, 206^4.
$C_{11}H_7N_3O_2$ 2-Naphthoyl azide, 3-hydroxy-, 1616^5.
$C_{11}H_8BrNO$ Naphthaldehyde, bromo-, oxime, $1216^{4,5}$.
$C_{11}H_8BrNO_2$ 2 - Naphthamide, 4 - bromo - 3 - hydroxy-, 910^4.
$C_{11}H_8BrN_3$ Pyridine, 4-(*p*-bromophenylazo)-, 1808^4.
$C_{11}H_8Br_2O$ Ether, 2,4-dibromo-1-naphthyl methyl, 1803^8.
$C_{11}H_8Br_2O_4$ Benzofuran, 2,3-dibromo-6-methoxy-1-methyl-4, 5-methylenedioxy , 3450^2.
Pyruvic acid, bromo(bromoanisal)-, 3164^8.
$C_{11}H_8Br_3NO_3$ 3-Indolinepropionic acid, 4,6,7-tribromo-2-keto-, 1989^b.
$C_{11}H_8Br_4N_2S$ Naphthothiazole, 2 amino-, tetrabromide, 2858^6.
$C_{11}H_8ClNO$ 4(1)-Pyridone, 1-(*p*-chlorophenyl)-, 585^2.
$C_{11}H_8ClNO_2$ 2 - Naphthamide, 4-chloro - 3 - hydroxy-, 1616^1.
$C_{11}H_8ClN_3$ Pyridine, 4-(*p*-chlorophenylazo)-, 1807^8.
$C_{11}H_8ClN_3O$ Phenol, chloro(4 pyridylazo)-, 1808^4
$C_{11}H_8Cl_2N_2O_8$ Malonic acid, (3,5-dichloro-2,4-dinitrophenyl) , di-Me ester, 1222^8.
$C_{11}H_8Cl_2O_2$ Chromone, 6-chloro-2-(chloromethyl)-3-methyl-, 1237^7.
$C_{11}H_8INO_3$ 3-Tricycloindolepropionic acid, 2,3-dihydro-6 iodo-2-keto-, 1989^7.
$C_{11}H_8N_2$ 3,9-Pyridindole, 415^6.
$C_{11}H_8N_2O_3$ 4(1)-Pyridone, 1-[*m*(and *p*) nitrophenyl]-, *and salts*, $586^{4,5}$
5-Pyrimidinecarboxylic acid, 1,4-dihydro-4-keto-2-phenyl , 206^4.
$C_{11}H_8N_2O_4$ Naphthalene, 1-methyl 2,4-dinitro-, 2325^2, 3001^8.
$C_{11}H_8N_2O_5$ Acetic acid, *α* cyano-*m*-nitrobenzoyl , methyl ester, 1926^8
$C_{11}H_8N_2S$ Naphthothiazole, 2-amino-, $2858^{5,6}$.
Naphthylamine, thiocyano , 1603^8.
$C_{11}H_8N_2S_2$ Quinrhodine, 3 methyl-, 1627^4
$C_{11}H_8N_4O_7$ Pyridine, picrate, 2501^2.
$C_{11}H_8O_2$ 1-Naphthaldehyde, 2 hydroxy-, 3165^9.
2-Naphthoic acid, 1074^9.
$C_{11}H_8O_3$ Naphthoic acid, hydroxy-, 1233^3, P 3171^6.
$C_{11}H_8O_4$ Chromone, 7-hydroxy-, acetate, 605^9.
2-Indanglyoxylic acid, 1-keto-, 1077^8.
$C_{11}H_9BrClN_3O$ 1-Imidazoleacetamide, bromo-5 chloro-2-phenyl , 1624^1.
$C_{11}H_9BrIN$ 3 Bromo-1-phenylpyridinium iodide, 741^9.
$C_{11}H_9BrN_4O_4$ 1,2,3,5-Tetrazole, 4-(5 bromo-2 hydroxyanisoyl)-, acetate, 3004^6.
$C_{11}H_9BrOS$ Thiochromone, 3-bromo-2,6 dimethyl-, 202^7.
$C_{11}H_9BrO_3$ Pyruvic acid, bromobenzal , methyl ester, 3164^8.
$C_{11}H_9BrO_4$ Benzofuran, 3-bromo-6 methoxy-1-methyl-4,5 methylenedioxy-, 3450^2.
Cinnamic acid, 2-bromo-4,5 methylenedioxy Me ester, 3292^8.
Pyruvic acid, anisalbromo , 3164^7.
$C_{11}H_9BrO_5S$ $\Delta^{3,\alpha}$-Benzisothioxoleacetic acid, ?-bromo-(?), *S* dioxide, Et ester, 1069^2.
1-Thionaphthenecarboxylic acid, ?-bromo-1,2-dihydro 2-keto-(?), *S*-dioxide, Et ester, 1069^2.
$C_{11}H_9Br_2NO_3$ Xylonitrile, dibromohydroxy-, acetate, $403^{8,9}$.
$C_{11}H_9Br_2NO_3$ 3-Indolinepropionic acid, 4,6-dibromo-2-keto , 1989^b.
$C_{11}H_9Br_2NO_4$ Glutaric acid, *α*-(4,6-dibromo-2,3-iminophenyl)-, 1989^6.
$C_{11}H_9Br_2N_3$ Pyridine, 4-[*β*-(2,4-dibromophenyl)-hydrazino]-, *and -HBr*, 1808^5.
$C_{11}H_9Br_3ClN$ 4-Chloro-1-phenylpyridinium tribromide, 586^8.
$C_{11}H_9Br_3N_2O_2$ 1-[*m*(*o* and *p*)-nitrophenyl]pyridinium tribromide, $586^{1,2,8}$.
$C_{11}H_9ClN_2O$ 1-Pyrazolecarboxylyl chloride, 3(or 5)-methyl-5(or 3)-phenyl-, 2856^3.
$C_{11}H_9ClN_2O_2$ 1-[*m*(*o* and *p*)-nitrophenyl]pyridinium chloride, *HgCl₂ compd.*, $586^{1,2,3}$.
$C_{11}H_9ClN_2O_6$ 1-(*p*-Nitrophenyl)pyridinium perchlorate, 586^2.
$C_{11}H_9ClN_2O_8$ Malonic acid, [3(and 5)-chloro-2,4-dinitrophenyl]-, di-Me ester, 1222^9.
$C_{11}H_9ClO_2$ Chromone, 3-chloro-2,6-dimethyl-, 1237^8.
---, 6-chloro 2-ethyl-, 1238^1.
Coumarin, 6-chloro 3,4 dimethyl , 1237^9.
$C_{11}H_9ClO_3$ *o*-Coumaryl chloride, acetate, 3291^5
$C_{11}H_9Cl_2N$ 4-Chloro-1-phenylpyridinium chloride, *and HgCl₂ compd.*, 586^8.
$C_{11}H_9Cl_2NO_4$ 4-Chloro-1-phenylpyridinium perchlorate, 586^8.
$C_{11}H_9Cl_2N_3$ Pyridine, 4 [*β*-(2,4-dichlorophenyl)-hydrazino]-, *and - HCl*, 1807^8, 1808^3.
$C_{11}H_9IN_2O$ 2-Furaldehyde, (*m*-iodophenyl)hydrazone, 1791^9.
$C_{11}H_9I_2N$ 3-Iodo-1-phenylpyridinium iodide, 742^1.
$C_{11}H_9I_2NO_3$ 3-Indolinepropionic acid, 4,6-diiodo-2 keto , 1989^7
$C_{11}H_9I_2NO_4$ Glutaric acid, *α*-(2,3 imino-4,6-diiodophenyl) , 1989^7.
$C_{11}H_9N$ Propiolonitrile, phenethyl-, 1783^8.
---, (2,4 xylyl)-, 1783^9.
$C_{11}H_9NO$ 4(1) Pyridone, 1 phenyl , *and salts*, 585^1, 586^4, 2163^1
$C_{11}H_9NO_2$ *o* Coumaronitrile, acetate, 3291^5.
3 Indolealdehyde, 1 acetyl , 758^7
1-Naphthamide, 3-hydroxy-, 1233^4.
Naphthoic acid, amino , 1075^1.
4(1)-Pyridone, 1 (*p* hydroxyphenyl) , 586^5.
$C_{11}H_9NO_3$ Acetic acid, benzoylcyano , methyl ester, 1926^8.
3-Furancarboxamide, 2,3-dihydro 2 keto-5 phenyl-, 404^8.
1 Naphthoic acid, 4 amino-3-hydroxy-, *and salts*, 1233^5
5(4) - Oxazolone, 4 (*p* - hydroxybenzal)-2-methyl-, 2683^4.
3 Tricycloindolepropionic acid, 2,3-dihydro-2 keto , 1989^8.
$C_{11}H_9NO_4$ 3-Quinaldinecarboxylic acid, 4-hydroxy , *N*-oxide, 1079^8.
$C_{11}H_9N_3$ Pyridine, 4-phenylazo , 1807^7.
$C_{11}H_9N_3O_5$ 1 (*m* nitrophenyl)pyridinium nitrate, 584^9.
$C_{11}H_{10}$ $\Delta^{1,3}$ Cyclopentadiene, 5-phenyl (?), 1392^8.
Naphthalene, methyl , 1178^9.
$C_{11}H_{10}BrN$ Naphthalenemethylamine, 5-bromo-, *and salts*, 1216^8.
$C_{11}H_{10}BrNO_2$ Cinnamaldehyde, *α*-bromo-, oxime, Ac deriv., 760^3.
$C_{11}H_{10}BrN_3$ Pyridine, 4-[*β*-(*p* bromophenyl)hydrazino]-, *and - HBr*, 1808^4.
$C_{11}H_{10}BrN_5O_7$ Pyrazole, 4-bromodimethyl-, picrate, 2494^8.
$C_{11}H_{10}Br_2N_2O_4$ Diacetamide, *N*-(2,6-dibromo-3-nitro *p* tolyl)-, 1223^1.

$C_{11}H_{10}Br_2OS$ 4-Thiochromanone, 3,3-dibromo-2,6-dimethyl-, 202[6].

$C_{11}H_{10}Br_2O_3$ Butyric acid, dibromoketophenyl-, methyl ester, 3164[6].

Cinnamic acid, dibromomethoxy-, methyl ester, 3164[8].

$C_{11}H_{10}Br_2O_4$ Butyric acid, anisyldibromoketo-, 3164[7].

$C_{11}H_{10}Br_3N$ 1-Phenylpyridinium tribromide, 586[1].

$C_{11}H_{10}Br_3NO_2$ Cinnamic acid, 3-amino-2,4,6-tribromo-(?), Et ester, 594[3].

$C_{11}H_{10}Br_5NO_2$ Hydrocinnamic acid, 3-amino-α,β,2,4,6-pentabromo (?), Et ester, 594[3].

$C_{11}H_{10}ClNO_2Sn$, 717[7].

$C_{11}H_{10}ClNO_3$ β-Butenyl chloride, γ-p-anisyl-α-keto-, oxime, 360[8].

$C_{11}H_{10}ClN_3$ Pyridine, 4-[β-(p-chlorophenyl)hydrazino]-, *and - HCl*, 1807[8], 1808[2].

$C_{11}H_{10}ClN_3O$ 1 Imidazoleacetamide, 5-chloro-2-phenyl-, 1624[1].

$C_{11}H_{10}ClN_3O_2$ 1,2,3-Triazole 4-carboxylic acid, 5-chloro-1 phenyl-, Et ester, 416[9].

$C_{11}H_{10}Cl_2O_2$ Malonyl chloride, benzylmethyl-, 1226[3].

$C_{11}H_{10}Cl_2O_2S$ 2,4 Pentanedione, 3-(2,5-dichlorophenylmercapto)-, 3289[6].

$C_{11}H_{10}INO_3$ 3-Indolinepropionic acid, 6 iodo 2-keto-, 1989[7].

$C_{11}H_{10}INO_4$ Glutaric acid, α (2,3-imino 4-iodophenyl)-, 1989[6].

$C_{11}H_{10}N_2$ 3 Indolepropionitrile, 759[7].

$C_{11}H_{10}N_2O$ 4(1)-Pyridone, 1 (p-aminophenyl)-, 586[4].

$C_{11}H_{10}N_2O_2$ 3 Isoindazolecarboxylic acid, 1-allyl-, 2496[8].

$C_{11}H_{10}N_2O_2S$ Hydantoin, 1 benzoyl-5-methyl-2-thio-, 1980[9], 3298[9].

$C_{11}H_{10}N_2O_3$ 2(3)-Benzimidazolone, 1,3 diacetyl-, 381[9].

1 Phenylpyridinium nitrate, 584[9].

1 Phthalazinol, 4-methoxy-, acetate, 185[4]

2,5-Pyrazinediol, 1,4-dihydro-, mono-Bz deriv., 3169[4].

Succinimide, α benzamido-, 49[8].

$C_{11}H_{10}N_2O_4$ 1,3-Isoindazoledicarboxylic acid, di Me ester, 2496[7].

1(2)-Phthalazone, 4 carboxyoxy-, Et ester, 382[1].

$C_{11}H_{10}N_2O_6$ Anisic acid, α carboxy 3,5 dinitro-, di-Me ester, 1068[9].

$C_{11}H_{10}N_3NaO_4S$ 1,2,3-Triazole 4-carboxylic acid, 5-hydroxy-1-p-tolylsulfonyl-, Me ester, Na deriv., 1408[7].

$C_{11}H_{10}N_4$ Triazene, 1-phenyl 3 (2 pyridyl)-, 2499[8].

$C_{11}H_{10}N_4O_2S$ 2 Furaldehyde, thiocarbohydrazone, 1811[1].

$C_{11}H_{10}N_4O_3$ 1,2,3,5-Tetrazole, 1 methyl 4-salicylyl-, acetate, 3004[7].

$C_{11}H_{10}OS$ Chromone, 2,3 dimethyl-4-thio-, *HgBr$_2$ addn. compd.*, 365[2].

Thiochromone, 2,6-dimethyl-, 202[7].

Thiophene, 3-p-anisyl-, 1078[9].

$C_{11}H_{10}O_2$ Chromone, 2,7-dimethyl-, 1237[1].

2-Furan α,γ,ϵ-heptatrienaldehyde, 1235[4].

α,γ-Pentadienic acid, δ-phenyl-, 1799[6].

$C_{11}H_{10}O_2S$ Thiochromone, 3-methoxy-6-methyl-, 199[3].

$C_{11}H_{10}O_3$ Δ^3-2-Butenone, 4-hydroxy-, benzoate, 3006[1].

—, 4-(3,4-methylenedioxyphenyl)-, 387[2].

Chromone, hydroxydimethyl-, 1237[8], 1624[6].

Umbelliferone, 4,5-dimethyl-, 909[2].

$C_{11}H_{10}O_4$ 4-Chromanone, 7-hydroxy-, acetate, 605[7].

Malonic acid, p-methylbenzal-, 1079[1].

Pyruvic acid, anisal-, 3164[7].

Succinic acid, benzal-, 1797[4].

$C_{11}H_{10}O_5$ Chromone, 5,7-dihydroxy-3-methoxy-2-methyl-, 195[9].

—, 3-hydroxy-7,8-dimethoxy-, 605[9].

Phthalic anhydride, 3-ethoxy-4-methoxy-, 3295[2].

$C_{11}H_{10}O_5S$ $\Delta^{3,\alpha}$-Benzisothioxoleacetic acid(?), S-dioxide, Et ester, 1069[2].

1-Thionaphthenecarboxylic acid, 1,2-dihydro-2-keto-(?), S-dioxide, Et ester, 1069[2], 2995[5].

—, 2 hydroxy-(?), S-dioxide, Et ester, 2995[5].

$C_{11}H_{10}O_6$ Gentisic acid, diacetate, 1613[7].

Malic acid, benzoate, 1057[4].

Protocatechuic acid, diacetate, 1613[7].

$C_{11}H_{10}O_7$ Benzoic acid, 2,3,4-trihydroxy-, 2,3-diacetate, 2489[2].

Gallic acid, diacetate, 1613[8].

$C_{11}H_{10}S$ Thiophene, 2(and 3)-p-tolyl-, 1079[1].

$C_{11}H_{11}BrN_2O$ Antipyrine, bromo-, 2857[5].

$C_{11}H_{11}BrN_4$ Imidazole, 2-(p-bromophenylazo)-4,5-dimethyl-, *and - HCl*, 193[8].

$C_{11}H_{11}BrO$ 1-Indanone, 2-bromo-2-ethyl-, 1620[1]

$C_{11}H_{11}BrOS$ 4-Thiochromanone, 3-bromo-2,6 dimethyl-, 202[6].

$C_{11}H_{11}BrO_3$ Cinnamic acid, bromomethoxy-, methyl ester, 3164[7].

1-Indanone, 2-bromo-5,6-dimethoxy-, 2326[2].

$C_{11}H_{11}BrO_4$ Hydrocinnamic acid, 2-bromo-4,5-methylenedioxy-, Me ester, 3292[5].

—, Toluenedio [illegible]

$C_{11}H_{11}BrO_6$ Glyoxylic acid, 5-bromo-2-hydroxy-p-anisyl-, Et ester, 3004[5].

$C_{11}H_{11}Br_3N_2$ 1-(m-Aminophenyl)pyridinium tribromide, 586[1].

$C_{11}H_{11}Br_4NO_2$ Hydrocinnamic acid, 2-amino α,β,3,5 tetrabromo-(?), Et ester, 594[3].

$C_{11}H_{11}ClN_2$ 1-(p-Aminophenyl)pyridinium chloride, *- HCl*, 586[2].

$C_{11}H_{11}ClN_2O_2S$ 2-Oxazolidone, 5-(chloromethyl)-3-phenylthiocarbamyl-, 2161[4].

$C_{11}H_{11}ClN_4O$ 4-Antipyrinediazonium chloride, 759[5].

$C_{11}H_{11}ClO_2S$ 2,4-Pentanedione, 3-(p-chlorophenylmercapto)-, 3289[6]

$C_{11}H_{11}ClO_3$ Acetophenone, 2-chloro-5-hydroxy 3-methyl-, acetate, 1238[2].

$C_{11}H_{11}Cl_2NO_4S$ Aspartyl chloride, N-p-tolylsulfonyl-, 1057[4].

$C_{11}H_{11}Cl_2N_3O_4$ Piperidine, 1 (3,5-dichloro-2,4-dinitrophenyl)-, 1222[7].

$C_{11}H_{11}Cl_3O_2$ 2-Butanol, 1-trichloro-, benzoate, 1218[1].

Phenethyl alcohol, α-(trichloromethyl)-, acetate, 1218[1].

$C_{11}H_{11}Cl_3O_4$ p-Toluic acid, 5-methoxy-2-(β-trichloro-α-hydroxyethyl)-, *and Ca salt*, 40[9].

$C_{11}H_{11}MoNO_6$ + $1.5H_2O$ Pyridine monopyrocatecholatomolybdate, 3405[8].

$C_{11}H_{11}MoNO_6$ + H_2O Pyridine monopyrogallol molybdates, 3405[6].

$C_{11}H_{11}N$ 1-Naphthylamine, N-methyl-, 384[9].

Quinoline, 1,2 dihydro-1-methyl-2-methylene-, 2861[9].

p-Toluquinaldine, 1627[7].

$C_{11}H_{11}NO$ Propiolamide, (2,4-xylyl)-, 1783[9].

Quinaldine, 4-methoxy-, 1626[1].

Quinoline, 4-methoxy-6-methyl-, 205[8].

$C_{11}H_{11}NOS$ Thiazole, 5-ethoxy-2-phenyl-, 2679[7].

$C_{11}H_{11}NOS_2$ Rhodanine, 3-(2,5-xylyl)-, 1080^{4}.
$C_{11}H_{11}NO_2$ Carbamic acid, phenylethinyl-, Et ester, 2157^{4}.
Chromone, dimethyl-, oxime, 1411^{9}, 1412^{2}.
Cresol, (methylisoxazolyl)-, 1412^{5}.
3-Indolepropionic acid, 759^{2}.
Melilotonitrile, acetate, 3291^{6}.
2,3-Quinolinedione, 1,4-dihydro-1,8-dimethyl-, 2681^{9}.
Succinimide, *N*-*p*-tolyl-, 186^{3}.
$C_{11}H_{11}NO_3$ Acetic anhydride, benzalamino-, 3283^{6}.
β-Butenealdehyde, *γ*-*p*-anisyl-*α*-keto-, aldoxime, 360^{5}.
o-Coumaramide, acetate, 3291^{5}.
3-Indolinepropionic acid, 2-keto-, 1989^{6}.
$C_{11}H_{11}NO_3S$ 1-Naphthalenesulfonic acid, 4-(aminomethyl)-, *and Ba salt*, 1216^{4}.
$C_{11}H_{11}NO_4$ Cinnamic acid, *α*-acetamido-*p*-hydroxy-, 2682^{4}.
—, nitro-, Et ester, 594^{1}.
Glutaric acid, *α*-(2,3-iminophenyl)-, 1989^{6}.
6-Phenomorpholinecarboxylic acid, 3-keto-4-methyl-, Me ester, 1068^{9}.
Veratric acid, 6-(cyanomethyl)-, 2331^{6}.
$C_{11}H_{11}NO_4S$ 2,4-Pentanedione, 3-(*o*-nitrophenylmercapto)-, 3289^{4}.
1-Thionaphthenecarboxylic acid, 2-amino-(?), *S*-dioxide, Et ester, 1069^{4}.
$C_{11}H_{11}NO_5$ Acetic acid, *o*-nitrobenzoyl-, Et ester, 1079^{3}.
3,4-Chromandione, 7,8-dimethoxy-, 3-oxime, 606^{2}.
Isatic acid, *N*-carboxy-, di-Me ester, 2997^{6}, Et ester, 2997^{7}.
$C_{11}H_{11}NO_6$ Cinnamic acid, dimethoxynitro, 1792^{9}.
$C_{11}H_{11}NO_7$ Anisic acid, *α*-carboxy-3-nitro, di-Me ester, 1068^{8}.
$C_{11}H_{11}N_3$ Pyridine, 4-(*β*-phenylhydrazino)-, *and -HCl*, 1807^{9}, 1808^{1}.
$C_{11}H_{11}N_3O$ 3-Butin-2-one, 4-phenyl, semicarbazone, 2856^{4}.
$C_{11}H_{11}N_3O_2$ Pyrazole, 3,5-dimethyl-1-(*p*-nitrophenyl)-, 761^{8}.
4(3) Quinazolone, 3-acetamido-2-methyl, 206^{7}.
$C_{11}H_{11}N_3O_3$ 1-(*p*-Aminophenyl)pyridinium nitrate, 586^{2}.
$C_{11}H_{11}N_3O_4$ 4-Imidazolecarboxanilide, tetrahydro-2,5-diketo-4-methoxy-, 3091^{6}.
1-Isoindazolecarboxylic acid, 5-methyl-7-nitro-, Et ester, 2498^{2}.
$C_{11}H_{11}N_3O_4S$ Malonamic acid, *α*-diazo-*N*-*p*-tolylsulfonyl-(?), Me ester, 1408^{7}.
1,2,3-Triazole-4-carboxylic acid, 4,5-dihydro-5-keto-1-*p*-tolylsulfonyl-(?), Me ester, 1408^{7}.
—, 5-hydroxy-1-*p*-tolylsulfonyl, Me ester, 1408^{7}.
$C_{11}H_{11}N_4NaO_4S$ 1,2,3-Triazole-4-carboxylic acid, 1-(*p*-aminophenylsulfonyl)-5-hydroxy-, Et ester, Na deriv., 1409^{9}.
$C_{11}H_{11}N_5O_2PbS$ 1,3,4-Triazole-2-mercaptan, 5-(benzalhydrazino)-, $Pb(OAc)_2$ deriv., 2162^{2}.
$C_{11}H_{11}N_5O_4$ 4-Antipyrinediazonium nitrate, 759^{4}.
$C_{11}H_{11}N_5O_7$ Pyrazole, dimethyl-, picrates, 2493^{6,7}, 2494^{3}, 2857^{2}.
$C_{11}H_{11}NaO_7$ 1,2,4-Bicyclo[0.1.2]pentanetricarboxylic acid, 3-keto-(?), tri-Me ester, Na deriv., 49^{1}.
$C_{11}H_{12}$ Xylene, propargyl-, 587^{9}.
$C_{11}H_{12}BrCl_2HgN$ Quinoline, complex salt with EtBr and $HgCl_2$, 3696^{1}.
$C_{11}H_{12}BrHgI_2N$ Quinoline, complex salt with EtBr and HgI_2, 3696^{1}.
$C_{11}H_{12}BrN$ Quinoline, complex salt with EtBr, 3695^{7}.
$C_{11}H_{12}Br_2HgIN$ Quinoline, complex salt with EtI and $HgBr_2$, 3696^{1}.
$C_{11}H_{12}Br_2OS$ 4-Thiochromanone, 2,6-dimethyl-, dibromide, 202^{6}.
$C_{11}H_{12}Br_3HgN$ Quinoline, complex salt with EtBr and $HgBr_2$, 3696^{1}.
$C_{11}H_{12}Br_3NO_2$ Hydrocinnamic acid, 4-amino-*β*,3,5-tribromo-(?), Et ester, 594^{2}.
$C_{11}H_{12}ClN$ Quinoline, complex salt, with EtCl, 3695^{7}.
$C_{11}H_{12}ClNO_3$ Alanine, *N*-benzoyl-*β*-chloro-, Me ester, 2983^{3}.
$C_{11}H_{12}ClNO_4$ Serine, *N*-chloroacetyl-*β*-phenyl-, 3450^{9}.
$C_{11}H_{12}ClN_3OS$ Oxazolidine, 5-(chloromethyl)-2-imino-3-phenylthiocarbamyl-, 2161^{2}.
Δ^2-Oxazoline, 5-(chloromethyl)-2-*β*-phenylthiocarbamido-, 2161^{3}.
$C_{11}H_{12}Cl_2HgIN$ Quinoline, complex salt with EtI and $HgCl_2$, 3696^{1}.
$C_{11}H_{12}Cl_2O_3$ *p*-Toluic acid, 2-(*β*,*β*-dichloroethyl)-5-methoxy-, 40^{9}.
$C_{11}H_{12}HgI_3N$ Quinoline, complex salt with EtI and HgI_2, 3696^{1}.
$C_{11}H_{12}IN$ 1-Methylquinaldinium iodide, 1627^{8}.
Quinoline, complex salt with EtI, 3695^{7}.
$C_{11}H_{12}N_2$ Pyrazole, 1-benzyl-3(and 5)-methyl, *and -HCl*, 3006^{9}.
—, 1,3(and 1,5)-dimethyl-5(and 3)-phenyl-, 2855^{9}.
$C_{11}H_{12}N_2O$ (See also *Antipyrine.*)
Butyrophenone, *α*-imino-, -HCN, 1798^{8}.
$C_{11}H_{12}N_2O_2$ (See also *Tryptophan.*)
2-Indazoleacetic acid, Et ester, 1622^{6}.
1,2,6-Isoxdiazine, 3(and 5)-(2,5-cresyl)-5-(and 3)-methyl-, 1412^{6}.
Δ^2-Oxazoline, 2 (*N*-methylbenzamido)-, 2161^{1}.
2,5-Piperazinedione, 3-benzyl-, 915^{8}.
Quinazolone, methoxydimethyl-, 207^{4,5}.
Valeraldehyde, *α*,*β*-diketo-, *α*-phenylhydrazone, 1590^{7}.
$C_{11}H_{12}N_2O_4$ Asparagine, N^{α}-benzoyl-, 49^{6}.
Glycine, *N*-(*β*-benzamido-*α*-hydroxyvinyl)-, 3169^{4}.
$C_{11}H_{12}N_2O_5$ Succin-*p*-toluidic acid, 2-nitro-, 186^{4}.
$C_{11}H_{12}N_2O_7$ 1-Propanol, 3-(2,4-dinitrophenoxy)-, acetate, 740^{1}.
$C_{11}H_{12}N_4O_4S$ 4-Antipyrinediazonium sulfate, 759^{4}.
Malonamic acid, *N*-(*p*-aminophenylsulfonyl)-*α*-diazo-, Et ester, 1409^{9}.
$C_{11}H_{12}N_4O_6$ 5,5′-Spirobi[hydantoin], 1,1′-diacetyl-3,3′-dimethyl-, 2826^{7}.
$C_{11}H_{12}N_6O$ 1,2,3,5-Tetrazole-4-carboxylic acid, 1-phenyl-, isopropylidenehydrazide, 763^{9}.
1,2,3-Triazole-4-aldehyde, 5-methyl-1-phenyl-, semicarbazone, 416^{8}.
$C_{11}H_{12}N_6O_7$ Imidazole, 2-amino-4,5-dihydro-, picrate, 193^{8}.
$C_{11}H_{12}O$ 1-Indanone, 2-ethyl-, 1620^{1}.
$C_{11}H_{12}OS$ 4-Thiochromanone, dimethyl-, 202^{6}, 204^{2}.
$C_{11}H_{12}O_2$ 2(1)-Benzofuranone, 3,4,6-trimethyl-, 2154^{2}.
Δ^3-2-Butenone, 4-methoxy-4-phenyl-, 194^{5}.
Cinnamic acid, Et ester, 402^{9}, 1060^{9}.
Cinnamic alcohol, acetate, 738^{4}.

Δ^{1}-3-Pentenone, 1-salicyl-, 387[1].

$C_{11}H_{12}O_2S$ 4-Thiochromanone, 2,6-dimethyl-, *S*-oxide, 202[9].

$C_{11}H_{12}O_3$ Acetic acid, benzoyl-, Et ester, 757[9], 1069[1,7].

Acetophenone, 4-hydroxy-3-methyl-, acetate, 1238[3].

Anisaldehyde, 2-allyloxy-, 382[7].

Benzaldehyde, 4-allyloxy-2-methoxy-, 382[7].

Benzoic acid, *m*-(γ-ketobutyl)-, 2843[4].

1,3-Butanedione, 1-(2,4-cresyl)-, 1237[1].

2-Butanone, 4-(3,4-methylenedioxyphenyl)-, 739[8].

Δ^{3}-2-Butenone, 4-(hydroxy-*m*-anisyl)-, 387[3], 2833[3,4].

—, 4-(3,4-methylenedioxyphenyl)-, 739[8].

Glyoxylic acid, *p*-cumenyl-, 1793[4].

Malonaldehydic acid, phenyl-, Et ester, 1788[8].

$C_{11}H_{12}O_4$ 4-Chromanone, 7,8-dimethoxy-, 606[3].

Hydrocinnamic acid, *o* (carboxymethyl)-, 1599[9].

Mandelic acid, Me ester, acetate, 378[2].

Succinic acid, *p*-tolyl-, 1079[1].

$C_{11}H_{12}O_5$ Acetophenone, α,4-dihydroxy-3-methoxy-, α-acetate, 3457[6].

Anisic acid, α-carboxy-, di-Me ester, 1068[7].

Succinic acid, *p*-anisyl-, 1078[9].

$C_{11}H_{12}O_6$ Isophthalic acid, hydroxymethoxy-, di-Me ester, 1613[2].

Phthalic acid, 3-ethoxy-4-methoxy-, 3295[2].

$C_{11}H_{12}O_6S$ Benzoic acid, *o*-(carboxymethylsulfonyl)-, di-Me ester, 2995[6].

$C_{11}H_{12}O_7$ 1,2,4-Bicyclo[0.1.2]pentanetricarboxylic acid, 3 keto-(?), tri-Me ester, 49[1].

Isophthalic acid, 4,5,6 trimethoxy-, 1613[4].

Protocatechuic acid, 5-(carboxymethoxy), di-Me ester, 1987[1].

$C_{11}H_{12}S$ 1,2-Benzothiopyran, 4,6 dimethyl-, 203[9], 204[1].

$C_{11}H_{13}BrClNO_3$ Acetic acid, bromochloro-, hydroxyhydrindamine salt, 3441[8].

$C_{11}H_{13}BrClNO_4$ 2-Pyrrolecarboxylic acid, 4-bromo-5-(hydroxymethyl)-3 methyl-, Et ester, chloroacetate, 2160[2].

$C_{11}H_{13}BrO_4S$ 2-Propanone, 1 bromo-3-[o(and *p*)-phenetylsulfonyl]-, 1625[8].

$C_{11}H_{13}ClHgO_2$ Benzoic acid, *p*-(chloromercuri)-, Bu ester, 1063[3].

$C_{11}H_{13}ClN_2$ Imidazole, 1-methyl-2-phenyl-, methochloride, *and chloroaurate*, 395[7].

$C_{11}H_{13}ClO_2$ Pseudocumenol, chloroacetate, 2154[8].

$C_{11}H_{13}ClO_3$ Hydrocinnamic acid, α-chloro-β-methoxy-, Me ester, 2997[3].

$C_{11}H_{13}Cl_2NO_3$ Acetic acid, dichloro-, hydroxyhydrindamine salt, 3444[9].

$C_{11}H_{13}Hg_2NO_4$ *o*-Toluidine, ?,?-bis(acetoxymercuri)-, 2817[9].

$C_{11}H_{13}N$ Aniline, *N*-ethyl-*N*-propargyl-, *and -HCl*, 3012[8].

Benzylamine, *N*-methyl-*N*-propargyl-, *and -HCl*, 390[2].

Pyridine, 3,5-diisopropenyl-, 2499[4].

$C_{11}H_{13}NO$ Benzamide, *N*-(cyclopropylmethyl)-, 390[8].

Benzoxazole, 1,3,4,6-tetramethyl-, 2154[7].

Cinnamimidic acid, Et ester, *-HCl*, 3291[4].

Δ^{3}-3-Pentenone, 1-anilino-, 1590[6].

α-Tolunitrile, (ethoxymethyl)-, 391[2,3].

$C_{11}H_{13}NOS$ Trimethylamine, α-2-furyl-α'-2-thienyl-, 390[7].

$C_{11}H_{13}NO_2$ 1,3,4-Benzoxazin-4-one, 2,3-dihydro-2-isopropyl-, 2674[2].

Butyric acid, β-benzalamino-, *Na salt*, 3283[4].

Cinnamic acid, amino-, Et ester, 594[1].

Δ^{2}-Cyclohexene-$\Delta^{1,\alpha}$ acetic acid, α-cyano-3-methyl-, Me ester, 2832[2].

Diacetamide, *N*-benzyl-, 1603[6].

4(1)-Quinolone, 6-ethoxy-2,3-dihydro-, 205[9].

Salicylamide, N-isobutylidene-, 2673[9].

α-Toluic acid, α-cyano-3,4-dihydro-5-methyl-, Me ester, 2832[3].

$C_{11}H_{13}NO_3$ (See also *Hydrastinine.*)

Acetanilide, *o*-(hydroxymethyl)-, acetate, 1073[8], 2840[5].

Anisaldehyde, 3-methyl-, oxime, Ac deriv., 179[8].

Carbamic acid, acetylphenyl-, ethyl ester, 1926[2].

Carbamic acid, α-toluyl-, ethyl ester, 3164[4].

3-Indolinepropionic acid, 2-hydroxy-, 2855[2].

Melilotamide, acetate, 3291[6].

Propionanilide, *o*-hydroxy-, acetate, 2319[8].

Propionic acid, *o*-acetamidophenyl ester, 2319[8].

Salicylamide, *N*-isobutyryl-, 2673[9].

$C_{11}H_{13}NO_4$ Benzoic acid, *p*-nitro-, *sec-* and *tert*-Bu esters, 2322[6].

Isatoic acid, *N*-methyl-, 2-Et ester, 207[3].

Meconin, 2-(aminomethyl)-, *-HCl*, 2330[9].

α-Toluic acid, carboxyamino-, ethyl ester, *and Na salt*, 3164[3].

$C_{11}H_{13}NO_5$ Benzaldehyde, 2,3-diethoxy-5(and 6)-nitro-, 179[2].

Benzyl alcohol, 4-ethoxy-2(and 3)-nitro-, acetate, 2833[7].

$C_{11}H_{13}NO_6$ 1,2,3-Cyclobutanetricarboxylic acid, 2-cyano-, tri-Me ester, 49[1].

$C_{11}H_{13}NO_6S$ Aspartic acid, *N*-*p*-tolylsulfonyl-, 1057[4].

$C_{11}H_{13}NO_6U$ Pyridine pyrocatecholaquouranate, 557[4].

$C_{11}H_{13}NO_7U$ Pyridine hydroxyhydroquinolaquouranate, 3656[7].

Pyridine pyrogallolaquouranate, 557[5].

$C_{11}H_{13}N_3O$ Antipyrine, amino, 1795[7].

$C_{11}H_{13}N_3OS$ 4-Thiochromanone, 2-methyl-, semicarbazone, 202[4].

$C_{11}H_{13}N_3O_2$ 1-Isoindazolecarboxylic acid, 7-amino-5-methyl-, Et ester, 2497[9].

$C_{11}H_{13}N_3O_2S$ 4-Thiochromanone, 6-methoxy-, semicarbazone, 202[3].

$C_{11}H_{13}N_3O_3$ 4-Chromanone, 6(and 8)-methoxy-, semicarbazone, 606[1,3].

Glyoxime, aminomethyl-, mono-Me ether, Bz deriv., 746[9].

Succinamide, α-benzamido-, 49[9].

$C_{11}H_{13}N_3S$ 1,4,3-Isothiodiazine, 2-ethylamino-5-phenyl-, 416[6].

$C_{11}H_{13}N_7$ 1,2,3-Triazole-4-aldehyde, 5-methyl-1-phenyl-, aminoguanidone, *-HNO₃*, 416[8].

$C_{11}H_{13}N_7O_7$ *s* Triazole, 3-amino-5-isopropyl-, picrate, 3293[7].

—, 3-amino-5-propyl-, picrate, 3293[7].

$C_{11}H_{14}$ Cyclopentane, phenyl-, 1303[1].

$C_{11}H_{14}AsNO_6$ Benzenearsonic acid, 4-carboxyoxy-3-nitro-, Bu ester, 1984[8]; isobutyl ester, 1984[8].

$C_{11}H_{14}BrN$ Aniline, *N*-β-bromoallyl-*N*-ethyl-, 3012[8].

Benzylamine, *N*-β-bromoallyl-*N*-methyl-, *and -HCl*, 390[2].

$C_{11}H_{14}BrNO_4$ 2-Pyrrolecarboxylic acid, 4-bromo-

5-(hydroxymethyl)-3-methyl-, Et ester, acetate, 2160[2].
$C_{11}H_{14}BrNS$ Valeranilide, *p*-bromothio-, 364[1].
$C_{11}H_{14}BrN_3O$ Acetophenone, α-bromo-2,4-dimethyl-, semicarbazone, 1783[6].
$C_{11}H_{14}Br_2N_2O_4$ Arabinose, (2,4-dibromophenyl)-hydrazone, 1794[7].
Xylose, (2,4 - dibromophenyl)hydrazone, 1794[7].
$C_{11}H_{14}Br_2N_4O_4$ Hydrouracil, 5,5′-methylenebis-[6-bromo-6-methyl-(?), 2682[1].
$C_{11}H_{14}ClNO_2$ 3,4-Dihydro-7-hydroxy-6-methoxy-2-methylisoquinolinium chloride, 3011[1].
$C_{11}H_{14}ClNO_6$ 3,4-Dihydro-7-hydroxy-6-methoxy-2 - methylisoquinolinium perchlorate, 3011[1].
$C_{11}H_{14}ClNS$ Valeranilide, *p*-chlorothio-, 364[1].
$C_{11}H_{14}Cl_2$ $\Delta^{1,3}$-*s*-Spirohendecadiene, 2,4-dichloro-, 1061[1].
$C_{11}H_{14}FeNO_3$, 1769[5].
$C_{11}H_{14}IN$ Dimethylphenylpropargylammonium iodide, 390[1].
$C_{11}H_{14}INO_2$ 3,4-Dihydro-7-hydroxy-6-methoxy-2-methylisoquinolinium iodide, 3011[1].
$C_{11}H_{14}IN_3O$ Acetophenone, α-iodo-2,4-dimethyl, semicarbazone, 1783[6].
$C_{11}H_{14}N_2$ Cyanamide, butylphenyl-, 390[6].
—, isobutylphenyl-, 2991[1].
3-Indolepropylamine, *and* - *HCl*, 759[3].
Tiglaldehyde, phenylhydrazone, 761[4].
$C_{11}H_{14}N_2O$ See *Cytisine*.
$C_{11}H_{14}N_2O_2$ Carbazic acid, β-benzal-, Pr ester, 1990[6].
Glyoxime, methylphenyl-, di Me ether, 747[1].
$C_{11}H_{14}N_2O_3$ Benzoic acid, *p*-(acetylhydrazino)-, Et ester, 1066[6].
1,3-Butanedione, 1-cresyl-, dioxime, 1412[4,5]
$C_{11}H_{14}N_2O_4$ Hydratropic acid, β-dimethylamino-*p*-nitro-, 1414[2].
Serine, *N*-glycyl-β-phenyl-, 3450[9].
$C_{11}H_{14}N_2O_5S$ Glycine, *N*-(*N*-tolylsulfonyl-glycyl)-, 3298[5].
$C_{11}H_{14}N_2O_6$ Anisole, 2-butoxy-4,5-dinitro, 1608[4].
$C_{11}H_{14}N_4O_3$ 2-Butanone, 4-(*m* nitrophenyl) semicarbazone, 175[6].
$C_{11}H_{14}N_4O_5S$ 1,2,3 Triazole-4-carboxylic acid, 5-hydroxy-1-*p*-tolylsulfonyl-, Me ester, NH_4 deriv., 1408[6]
$C_{11}H_{14}N_6O_2$ Acetaldehyde, benzoyl-, disemicarbazone, 760[5].
Pyruvaldehyde, phenyl-, disemicarbazone, 760[2].
$C_{11}H_{14}N_6S_2$ Carbazic acid, β-(4-pyridyl)dithio, 4-hydrazinopyridine salt, 1807[4].
$C_{11}H_{14}O$ Cyclopentanol, phenyl-, 1393[3].
7-*p*-Cymenealdehyde, 2488[7].
3-Pentanone, 1-phenyl-, 2997[5].
Δ^4-2-Pentenol, 2-phenyl, 1602[4].
$C_{11}H_{14}OS$ 4-Thiochromanol, 4,6-dimethyl[6], 203[6].
$C_{11}H_{14}O_2$ Acetophenone, ethylhydroxymethyl, 2154[9].
—, hydroxytrimethyl-, 2154[7,8].
—, methoxydimethyl-, 2154[4,5,6].
2-Butanone, anisyl-, 739[4,6], 2850[7].
—, 1-hydroxy-3-methyl-1-phenyl-, 906[6].
Butyrophenone, *p*-methoxy-, 1229[1].
Cresol, ethyl-, acetate, 2154[9].
Cumic acid, Me ester, 1793[5].
7-*p*-Cymenecarboxylic acid, 2488[7].
Ethylene oxide, β-*p*-anisyl-α,α-dimethyl, 2850[6].
Hemimellitenol, acetate, 1602[1].
Hydrocinnamic acid, α-methyl-, Me ester, 592[6].
Isobutyrophenone, *p*-methoxy-, 1229[3], 2850[6].
Isopseudocumenol, acetate, 2154[9].
Isosaffroeugenol, 2843[8].
Linderene, 2679[2].
Mesitol, acetate, 2154[9].
2-Pentanone, 1-hydroxy-1-phenyl-, 906[5].
Δ^1-3-Pentenone, 1-(2-furyl)-4,4-dimethyl-, 3005[2].
Phenol, 5-allyl-2-ethoxy-, 402[3].
—, 2-ethoxy-5-propenyl-, 402[4].
Pseudocumenol, acetate, 2154[9].
o-Tolualdehyde, 3,6-dihydro-5-isopropyl-6-keto-, 2846[8].
Veratrole, allyl-, 1798[2].
$C_{11}H_{14}O_2S$ Butyric acid, β-*p*-tolylmercapto-, 202[3].
Thiochroman, 6,8-dimethyl-, *S*-dioxide, 203[8].
$C_{11}H_{14}O_3$ Anisaldehyde, 2-propoxy-, 382[7].
Benzaldehyde, 2-methoxy-4-propoxy-, 382[6].
2-Butanol, 4-(3,4-methylenedioxyphenyl)-, 739[5].
Isovalerophenone, 2,4-dihydroxy-, 2320[3].
Spiro[cyclohexane - 1,4′ - cyclopentene]-3′,5′-dione, 2′-methoxy-, 3286[7].
Valerophenone, 2,4-dihydroxy-, 2320[2].
$C_{11}H_{14}O_4$ Anisic acid, 5-ethoxy-2-methyl-, 765[3].
2-Benzofuranpropionic acid, 1,2,3,4,5,6-hexahydro-1 keto-, 1989[6].
Δ^3-2-Butenone, 4-(2-hydroxy-*m*-anisyl)-, hydrate, 2833[4].
Pyrocatechol, 5 - allyl - 3,4 - dimethoxy-(?), 3450[1],
—, 3,4-dimethoxy-5 propenyl-(?), 3450[1].
$C_{11}H_{14}O_4S$ 2-Propanone, 1 (*o*-phenetylsulfonyl)-, 419[3].
$C_{11}H_{14}O_5$ Gallic acid, Bu ester, 1986[9], 1987[3].
$\Delta^{1,4}$-1,5-Pentadienedicarboxylic acid, 3-keto, di-Et ester, 180[9].
Propionic acid, β-(2,3 dimethoxyphenoxy), 606[3].
$C_{11}H_{14}O_7$ Cyclopentanecarboxylic acid, dicarboxypropylketo, 3440[6].
$C_{11}H_{14}O_9$ 1,1,3,3-Propanetetracarboxylic acid, 2-keto-, tetra-Me ester, 2860[6]
$C_{11}H_{14}S$ Thiochroman, 6,8-dimethyl, 203[8], 204[1].
$C_{11}H_{15}AsO_5$ Benzenearsonic acid, *m*(and *p*) carboxyoxy-, Bu ester, 1984[8]; isobutyl ester, 1984[8].
$C_{11}H_{15}BrO_2$ Benzyl alcohol, 5 bromo-2,3 diethoxy, 1792[9].
$C_{11}H_{15}ClO$ Δ^5-*s*-Spirohendecen-2-one, 4 chloro-, 1060[9].
$C_{11}H_{15}IS$ Homoisothiochroman, methiodide, 906[1].
$C_{11}H_{15}N$ Aniline, *N*-(cyclopropylmethyl)-*N*-methyl, 390[9].
1 Indanamine, *N*, *N*-dimethyl, 755[8]
—, *N* ethyl-, 755[9].
$C_{11}H_{15}NO$ Benzamide, *N*, *N* diethyl, 2997[9].
Camphor, 3-cyano, P 2167[7].
2(1) - Isoquinolineethanol, 3,4-dihydro, 2862[9].
Pulegone, 2-cyano-, P 2167[8].
Thujone, 5-cyano, P 2167[8].
$C_{11}H_{15}NOS$ Benzoic acid, *p*-dimethylamino thiol-, Et ester, 371[4].
Thiomorpholine, 4-benzyl-, 1-oxide, *and* - *HCl*, 40[1].
$C_{11}H_{15}NO_2$ Acetanilide, 2-hydroxy - 3,5,6 - trimethyl-, 2154[7].
Acetophenetide, methyl-, 3712[8].

Acetophenone, hydroxytrimethyl-, oxime, 2154[7,8].
Benzoic acid, dimethylaminoethyl ester, -*HCl*, 2727[8].
—, *p*-amino-, Bu ester, 2322[7]; isobutyl ester, 1612[4].
Hydrocinnamic acid, β-amino, Et ester, *and salts*, 3291[9].
Hydroxylamine, β,β-diethyl-, benzoate, *and bisulfate*, 372[4].
Isobutyrophenone, *p*-methoxy-, oxime, 2850[6].
Isonicotinic acid, 2-*tert*-butyl-6-methyl-, 3297[1].
Nicotinic acid, 6-*tert*-butyl-2-methyl-, 3296[9].
Propionanilide, *p*-ethoxy-, 1218[6].
3-Pyrroleacrylic acid, 5-ethyl-2,4-dimethyl-, 1236[2], 1621[1].
2-Pyrrolealdehyde, 5-ethyl-3-methyl-4-propionyl-, 1236[4].
2-Pyrrolecarboxylic acid, 3,5-dimethyl-4-vinyl-, Et ester, 1621[1].
o-Tolualdehyde, 3,6-dihydro-5-isopropyl-6-keto-, oxime, 2846[8].
α-Toluic acid, *o*-(aminomethyl), Et ester, -*HCl*, 392[1].
$C_{11}H_{15}NO_2S$ Thiomorpholine, 4-benzyl-, 1-dioxide, *and* -*HCl*, 40[1].
$C_{11}H_{15}NO_3$ Alanine, β-*p*-anisyl-, Me ester, *and* -*HCl*, 417[5].
Carbanilic acid, *o*-hydroxy-, Bu and isobutyl esters, 2319[9].
3-Indolepropionic acid, 2,3,4,5,6,7-hexahydro-2-keto-, 1980[5].
Lactophenine, 2301[2]
2-Pyrrolecarboxylic acid, 4-ethyl-5-formyl-3-methyl-, Et ester, 2160[7].
—, ethylmethylpropionyl-, 1236[3], 3403[6]
Spiro[cyclohexane-1,4′-cyclopentene]-3′,5′-dione, 2′-methoxy-, 3′-oxime, 3286[7]
$C_{11}H_{15}NO_4$ Anisole, 2-butoxy-4(and 5)-nitro-, 1608[2].
Phenetole, 4-(ethoxymethyl)-2(and 3)-nitro-, 2833[9].
2,3-Pyrroledicarboxylic acid, 4-methyl-, diethyl ester, 3455[2].
$C_{11}H_{15}NO_4S$ 2-Propanone, 1-(*o*-phenetylsulfonyl)-, oxime, 419[2].
$C_{11}H_{15}NO_5$ Benzyl alcohol, 2,3-diethoxy-5-nitro-, 1792[9].
Veratric acid, 6-(β-amino-α-hydroxyethyl)-, 2330[9], 2331[1].
$C_{11}H_{15}NS$ Thiomorpholine, 4-benzyl-, *and* -*HCl*, 40[1].
Valeranilide, thio-, 364[1].
$C_{11}H_{15}N_3O$ 2-Butanone, 3-phenyl-, semicarbazone, 2996[7].
Dicyclopentadiene, dihydroketo-, semicarbazone, 384[6].
Isobutyrophenone, semicarbazone, 2996[7].
$C_{11}H_{15}N_3O_2$ Acetophenone, 2-hydroxy-3,5(and 4,5)-dimethyl-, semicarbazone, 2154[4,8].
2-Butanone, 1-hydroxy-1-phenyl-, semicarbazone, 906[6].
Δ^1-3-Pentenone, 1-(2-furyl)-2-methyl-, semicarbazone, 3005[2].
o-Tolualdehyde, 5-ethyl-4-hydroxy-, semicarbazone, 2154[5].
$C_{11}H_{15}N_3O_3$ Acetophenone, 3,4-dimethoxy-, semicarbazone, 2321[8].
$C_{11}H_{15}N_3O_3S$ Sulfanilic acid, *N*-acetyl-, isopropylidenehydrazide, 1409[6].
$C_{11}H_{15}N_3S$ Acetone, thio-4-*p*-tolylsemicarbazone, 2161[9].
$C_{11}H_{16}$ Benzene, pentamethyl-, 1984[1].
$C_{11}H_{16}AgN_3O_2$ 2-Fenchanenitrile, 2-nitrosohydroxamino-, Ag deriv., 596[4].
$C_{11}H_{16}AsI$ Arsinoline, 1,2,3,4-tetrahydro-1-methyl-, methiodide, 2839[5].
$C_{11}H_{16}AsNO_4$ Arsanilic acid, *N*-valeryl-, 1605[9].
$C_{11}H_{16}AsNO_5$ Carbanilic acid, *p*-arsono-, Bu ester, 1605[9].
$C_{11}H_{16}BrNO_2$ 2-Pyrrolecarboxylic acid, 5-(bromomethyl)-4-ethyl-3-methyl-, Et ester, 2160[6].
$C_{11}H_{16}Cl_2O$ Camphane-2-*exo*-carboxylyl chloride, 2-*endo*-chloro-, 2847[4].
$C_{11}H_{16}KN_3O_2$ 2-Camphanenitrile, 2-nitrosohydroxamino-, K deriv., 596[1].
$C_{11}H_{16}N_2O$ 2(1)-Pyridone, 1-methyl-3-(tetrahydro-1-methyl-2-pyrryl)-, 2982[8].
$C_{11}H_{16}N_2O_2$ (See also *Pilocarpine.*)
Benzoic acid, *p*-amino-, β-dimethylaminoethyl ester, -*HCl*, 1852[8].
Carbazic acid, β-phenyl-, Bu ester, 2485[6].
2-Indazolecarboxylic acid, 4,5,6,7-tetrahydro-4,6-dimethyl-, Me ester, 389[8].
Isopilocarpine, 2108[5].
2-Pyrrolealdehyde, 5-ethyl-3-methyl-4-propionyl-, oxime, 1236[4].
$C_{11}H_{16}N_2O_3$ Barbituric acid, 5-allyl-5-butyl-, 458[8].
—, 5-allyl-5-*sec*-butyl-, 458[8].
—, 5-allyl-5-isobutyl-, 458[8].
2-Pyrrolecarboxylic acid, 4-ethyl-5-formyl-3-methyl-, Et ester, oxime, 2160[7].
$C_{11}H_{16}N_2O_4$ Butyrophenone, β-hydroxamino-β,2-dihydroxy-5-methyl-, oxime, 1412[5].
$C_{11}H_{16}N_2O_5$ Glutaconic acid, (carbamidomethylene)-, diethyl ester, 3169[2].
$C_{11}H_{16}N_2O_5S$ Uracil xyloside, ethylthio-, 1812[7].
$C_{11}H_{16}N_2S$ Pseudourea, α-ethyl-β,γ-dimethyl-α-phenylthio-, 374[2].
$C_{11}H_{16}N_4O_4S_2$ Hydrouracil, 5,5′-methylenebis[6-hydroxy-6-methyl-2-thio-, 2682[1].
$C_{11}H_{16}N_4S$ Camphorquinone, cyclic thiocarbohydrazone, 1810[8].
$C_{11}H_{16}N_6O_7$ Guanidine, α-ethyl-β,γ-dimethyl-, picrate, 3284[7].
$C_{11}H_{16}O$ Anisole, *p*-butyl-, 739[7].
Benzyl alcohol, α,α-diethyl-, 1798[8].
2,3,4-Hemimellitenol, 6-ethyl-, 2154[8].
Phenethyl alcohol, *p*-isopropyl-, 1793[6], 2488[7].
Phenetole, *p*-isopropyl-, 1793[4].
Pseudocumenol, 6-ethyl-, 2154[7].
$C_{11}H_{16}OS$ Ether, β-(benzylmercapto)ethyl ethyl, 737[4].
$C_{11}H_{16}O_2$ Anisole, 2-butoxy-, 1608[2].
2-Butanol, 4-*o*(and *p*)-anisyl-, 739[5,6].
Δ^1-Cyclohexenecarboxylic acid, 6-(α-hydroxybutyl)-, lactone, 2490[4].
Isomeric acids from 2-hydroxy-2-camphanenitrile, 596[2,3].
Phenol, 2-ethoxy-5-propyl-, 402[3].
Resorcinol, 4-amyl-, 2320[3].
—, 4-isoamyl-, 2320[3].
$C_{11}H_{16}O_2S$ *p*-Toluenesulfinic acid, Bu ester, 307[3], 3694[1].
$C_{11}H_{16}O_3$ Benzyl alcohol, 2,3-diethoxy-, 1792[9].
Carbinol, phenylethenyltris-, 1396[7].
5-Epicamphorcarboxylic acid, 2674[9].
1,2-Propanediol, 1-*p*-anisyl-2-methyl-, 2850[6].
Pyromucic acid, hexyl ester, 1620[8]; α-methylamyl ester, 1620[8].
$C_{11}H_{16}O_4$ 2-Benzofurancarboxylic acid, octahydro-1-keto-, Et ester, 1989[4].
2-Benzofuranpropionic acid, octahydro-1-keto-, 1989[4].

$C_{11}H_{16}O_5$ Cyclopentanedicarboxylic acid, keto-, di-Et ester, 2823[8].
Glutaric acid, α-(2-ketocyclohexyl)-, 1989[4].
$C_{11}H_{16}O_6$ Δ^2-1,1,5-Pentenetricarboxylic acid, tri-Me ester, 1592[8].
$C_{11}H_{17}As$ Arsine, dimethyl(γ-phenylpropyl)-, 2839[5].
$C_{11}H_{17}AsI_4$ Benzyltrimethylarsonium iodide, CHI_3 addn. compd., 2815[8].
$C_{11}H_{17}ClN_4O_3$ Me ester of tetrapeptide from 3,6-dihydro-3-methylene-2,5-pyrazinediol, -*HCl*, 381[7].
$C_{11}H_{17}ClO$ Isocamphanecarboxylyl chloride, 2847[3].
$C_{11}H_{17}ClO_4$ Succinic acid, α-(α-chloroethylidene)-β-methyl-, di-Et ester, 2824[4].
$C_{11}H_{17}N$ Benzylamine, *N*, *N*-diethyl, 2835[3], 3688[6].
Pyridine, 3,5-diisopropyl-, 2499[4].
$C_{11}H_{17}NO$ 2-Camphanenitrile, 2-hydroxy-, 596[2].
2-Fenchanenitrile, 2-hydroxy-, 596[1].
Menthone, 2-cyano-, P 2167[8].
Phenethylamine, (ethoxymethyl)-, *and -HCl*, 391[6,8].
$C_{11}H_{17}NO_2$ Camphonanic acid, 3-cyano-, Me ester, 2999[3].
Cyclopentanecarboxylic acid, 3-cyano-1,2,2-trimethyl-, Me ester, 2158[1].
2-Pyrrolecarboxylic acid, 4-ethyl-3,5-dimethyl-, Et ester, 1621[2].
3-Pyrrolepropionic acid, 5-ethyl-2,4-dimethyl, 1236[1].
Toluidine, *N*, *N*-dimethyl-, acetate, 588[7].
$C_{11}H_{17}N_3O$ 6-Camphenone, semicarbazone, 1800[4].
Teresantalaldehyde, semicarbazone, 1227[4].
2,4-Xylenol, 6-ethyl-, semicarbazone, 2154[5].
$C_{11}H_{17}N_3O_2$ 2-Fenchanenitrile, 2-nitrosohydroxamino-, 596[4].
$C_{11}H_{17}N_5O_3$ Acetoacetic acid, (5-isopropyl-3-*s*-triazolylazo)-, Et ester, 3294[2].
—, (5-propyl-3-*s*-triazolylazo)-, Et ester, 3294[2].
$C_{11}H_{18}AsI$ Benzylethyldimethylarsonium iodide, 2839[6].
$C_{11}H_{18}Br_2O$ Ketone, bromomethyl 1,2,2,3-tetramethylcyclopentyl, 1399[2].
$C_{11}H_{18}ClNO$ Camphane-2-*exo*-carboxamide, 2 *endo*-chloro-, 2847[4].
$C_{11}H_{18}ClN_3O$ Epicamphor, 5-chloro-, semicarbazone, 2675[1].
$C_{11}H_{18}N_2$ Indazole, 2-ethyl-4,5,6,7-tetrahydro-4,6-dimethyl-, 389[7].
Isoindazole, 1-ethyl-4,5,6,7-tetrahydro-4,6-dimethyl-, 389[7].
$C_{11}H_{18}N_2O$ Camphenilone, acetylhydrazone, 2846[8].
Fenchocamphorone, acetylhydrazone, 2846[7].
Santenone, acetylhydrazone, 2846[9].
$C_{11}H_{18}N_2O_2$ Compd., m. 87°, from Et 4-amino-3,5-dimethyl-2-pyrrolecarboxylate and Me_2SO_4, 1235[9].
$C_{11}H_{18}N_2O_3$ (See also *Amytal*.)
Barbituric acid, 5-butyl-5-isopropyl-, 458[7].
Cyclohexanecarbinol, α-vinyl-, allophanate, 2666[2].
1-Octin-3-ol, 3-methyl-, allophanate, 2481[6].
$C_{11}H_{18}N_2O_4$ Barbituric acid, 5-(butoxymethyl)-5-ethyl-, 581[9].
—, 5-ethyl-5-(isobutoxymethyl)-, 581[9].
2-Piperazinepropionic acid, 5-isobutyl-3,6-diketo-, 3298[7].
$C_{11}H_{18}N_4O_4$ 4-Imidazolecarboxamide, 4-ethoxy-tetrahydro-2-keto-*N*,3-dimethyl-5-methylimino-, Ac deriv., 3691[6].
$C_{11}H_{18}N_4O_5$ Uric acid, 4,5-diethoxy-4,5-dihydro-3,7-dimethyl-, 1387[7].
$C_{11}H_{18}O$ Compd., b_4 102–5°, from Et_2CO and mesityl oxide, 3157[6].
Compd., b_{13} 122–6°, from MePrCO and mesityl oxide, 3157[6].
Menthone, 2-methylene-, 2846[2].
2-*s*-Spirohendecanone, 1060[8].
$C_{11}H_{18}O_2$ 2-Camphanecarboxylic acid, 595[9].
Camphor, 3-methoxy-, 2157[7].
Δ^1-Cyclohexeneacetic acid, 3-methyl-, Et ester, 903[7].
$C_{11}H_{18}O_3$ Cyclohexaneacetic acid, 1-acetonyl-, 1060[7].
—, 3-keto-1-methyl-, Et ester, 172[6].
$C_{11}H_{18}O_4$ Cyclohexaneacetic acid, α-hydroxy-, Me ester, acetate, 378[4].
Cyclohexanepropionic acid, 1-(carboxymethyl)-, *and Ca salt*, 1060[9].
γ-Pentenic acid, α,α-diethyl-δ-hydroxy-β-keto-, Et ester, 1590[7].
$C_{11}H_{18}O_5$ 1,2-Cyclopentanedicarboxylic acid, 1-hydroxy-, di-Et ester, 2830[8].
Glutaric acid, α-keto-β,β-dipropyl-, 3155[1].
$C_{11}H_{18}O_6$ 1,1,2-Ethanetricarboxylic acid, tri-Et ester, 3689[9].
Succinic acid, β-carbethoxyethyl-, Et ester, 409[2].
$C_{11}H_{19}Br$ 1-Hendecine, 1-bromo-, 1783[1].
$C_{11}H_{19}BrO$ Ketone, bromomethyl 1,2,2,3-tetramethylcyclopentyl, 1399[2].
$C_{11}H_{19}BrO_2$ Cyclohexaneacetic acid, α-bromo-3-methyl-, Et ester, 903[8].
$C_{11}H_{19}I$ 1-Hendecine, 1-iodo-, 1783[2].
$C_{11}H_{19}I_3$ 1-Hendecene, 1,1,2-triiodo-, 1783[7].
$C_{11}H_{19}NO$ Camphor, 3-methylamino-, -*HCl*, P 2167[8].
2-*s*-Spirohendecanone, oxime, 1060[8].
$C_{11}H_{19}NO_2$ 2-Camphanecarboxamide, 2-hydroxy-, 596[2].
2-Fenchanecarboxamide, 2-hydroxy-, 596[4].
$C_{11}H_{19}NO_3$ Nipecotic acid, 1-isopropyl-4 keto-, Et ester, -*HCl*, 3010[2].
—, 4-keto-1-propyl-, Et ester, -*HCl*, 3010[1].
$C_{11}H_{19}N_3O$ 2-Butanone, Δ^1-cyclohexenyl-, semicarbazone, 3287[4,5].
—, 4-cyclohexylidene-, semicarbazone, 3287[7].
Δ^3-2-Butenone, 4-cyclohexyl-, semicarbazone, 3287[8].
Semicarbazone, m. 176°, from condensation product of MeEtCO and mesityl oxide, 3157[4].
$C_{11}H_{19}N_3O_3$ Cyclohexaneacetic acid, 1-acetyl-, semicarbazone, 3693[4].
$C_{11}H_{19}N_3S$ Cyclohexenone, isopropylmethyl-, thiosemicarbazone, 3161[2].
$C_{11}H_{20}$ Cyclohexane, cyclopentyl-, 1392[9].
Naphthalene, decahydromethyl-, 2935[7].
s-Spirohendecane, 1060[9].
$C_{11}H_{20}BrNO_2$ 1,1'-Spirobipiperidine-4-carboxylic acid, *N*-hydroxy-, bromide, 385[6].
$C_{11}H_{20}BrNO_4$ Valeric acid, α-(α-bromoisocaproylamino)-δ-hydroxy-, 3170[1].
$C_{11}H_{20}N_2O_2$ 2(1)-Pyrazinone, 3,4-dihydro-5-hydroxy-3-isobutyl-6-isopropyl-, 1629[4].
$C_{11}H_{20}N_2O_5$ Butyric acid, β-(α-carbethoxyaminoacetamido)-, Et ester, 44[9].
—, β-(β-carboxyamino-α-hydroxyethylideneamino)-, di-Et ester, 44[6].
Glutamic acid, *N*-*l*-leucyl-, 3298[1].
$C_{11}H_{20}N_2O_6$ Arabinose, ureide, 1596[8].
Xylose, ureide, 1595[9].

$C_{11}H_{20}N_4$ Isobutyronitrile, *N*, *N'*-trimethylenebis[α-amino-, *and di- HCl*, 370[7].
$C_{11}H_{20}N_6O_2$ Cyclohexanealdehyde, 2-keto-4,6-dimethyl-, disemicarbazone, 389[3].
$C_{11}H_{20}O$ Cyclohendecanone, 1792[5].
2-*s*-Spirohendecanol, 1060[8].
$C_{11}H_{20}O_2$ Cyclohexaneacetic acid, 3-methyl-, Et ester, 903[7,8].
Cyclohexanevaleric acid, 3160[4].
2,4-Hendecanedione, 738[9].
Δ[5]-2-Heptenol, 2,6-dimethyl-, acetate, 3687[1].
Ketone, hydroxymethyl 1,2,2,3-tetramethylcyclopentyl, 1399[3].
Menthone, 2-(hydroxymethyl)-, 2846[1].
$C_{11}H_{20}O_3$ Cyclohexaneacetic acid, 1-hydroxy-3-methyl-, Et ester, 903[6].
Enanthic acid, γ-keto-α,ε-dimethyl-, Et ester, 407[5].
3-*p*-Menthanecarboxylic acid, 3-hydroxy-, 1071[1].
Pelargonic acid, θ-formyl-, Me ester, 1590[2].
$C_{11}H_{20}O_4$ Malonic acid, di-Bu ester, 3689[8].
—, butyl-, di-Et ester, 47[4].
—, diethyl-, di-Et ester, 1056[2].
Nonanedicarboxylic acid, 1789[2], 2937[5].
Sebacic acid, mono-Me ester, 1590[3].
5,5'-Spirobi[*m*-dioxane], 2,2'-diethyl-, 2109[1].
—, 2,2,2',2'-tetra methyl-, 2109[2].
$C_{11}H_{20}O_5$ Malonic acid, ethyl(methoxymethyl)-, di-Et ester, 581[9]
—, propoxymethyl-, di-Et ester, 581[9].
Succinic acid (ethoxymethyl)-, di-Et ester, 2823[9].
$C_{11}H_{20}O_6$ Azelaic acid, α,η-dimethoxy-, 2831[2].
Malonic acid, bis(methoxymethyl)-, di-Et ester, 581[9].
$C_{11}H_{20}O_7$ Me deriv., m. 102–3°, from tetramethylglucose, 3285[4].
$C_{11}H_{20}O_{10}$ (See also *Primeverose.*)
d-Gluco-*d*-arabinose, 2988[4].
Vicianose, 435[3], 1632[4].
$C_{11}H_{21}Br$ Cyclohexane, bromoamyl , 3160[1].
$C_{11}H_{21}BrO$ 2-Hendecanone, 1-bromo-, 1783[6].
$C_{11}H_{21}ClO$ 2-Hendecanone, 1-chloro-, 1783[7].
$C_{11}H_{21}NO$ Ketone, aminomethyl 1,2,2,3-tetramethylcyclopentyl, 1399[8].
$C_{11}H_{21}NOS$ Carbamic acid, thiono-, menthyl ester, 373[4].
$C_{11}H_{21}NO_3$ Nipecotic acid, 4-hydroxy-1-isopropyl-, Et ester, 3010[3].
—, 4-hydroxy-1-propyl-, Et ester, 3010[2].
$C_{11}H_{21}NO_4$ Rhamnosyl-1-dimethylamine, monoacetone-, 2827[7].
$C_{11}H_{21}N_3O$ Cyclodecanone, semicarbazone, 1792[4].
Menthone, semicarbazone, 751[9].
Δ[7]-4-Octenone, 2,6-dimethyl-, semicarbazone, 407[4].
$C_{11}H_{21}N_3O_2$ 2-Butanone, 4-cyclohexyl-4-hydroxy-, semicarbazone, 3287[9].
$C_{11}H_{21}N_3O_3$ Caprylic acid, η-formyl-, Me ester, semicarbazone, 1590[1].
$C_{11}H_{22}$ Hendecanaphthene, 816[7].
$C_{11}H_{22}Br_2$ Hendecane, 1,11-dibromo-, 1789[2].
$C_{11}H_{22}INO_3$ 3 - Carboxy - 4 - hydroxy-1,1,4-trimethylpiperidinium iodide, Et ester, 1810[6].
$C_{11}H_{22}N_2$ 2,5-Pyrrolopyrazine, octahydro-3-isobutyl-, 55[3].
$C_{11}H_{22}N_2O_3$ Glycine, *N*-(trimethylleucyl)-, 3160[8].
$C_{11}H_{22}N_2O_4$ Alanine, *N*, *N'*-pentamethylenebis-, *salts*, 370[8].
Azelaamide, α,η-dimethoxy-, 2831[2].
Isobutyric acid, *N*, *N'*-trimethylenebis[α-amino-, *and Cu salt*, 370[7].
Valeric acid, δ-hydroxy-α-leucylamino-, 3170[2].
$C_{11}H_{22}N_6O_2$ Pelargonaldehyde, η-keto-(?), disemicarbazone, 2151[1].
$C_{11}H_{22}O$ Anisole, *p*-butylhexahydro-, 739[7].
Cyclohexanepentanol, 3159[9].
Δ[8]-5-Decenol, 5-methyl-, 1602[5].
Linderol, 2678[9].
Δ[7]-4-Nonenol, 4,8-dimethyl-, 3687[1].
Δ[6]-3-Octenol, 2,3,7-trimethyl-, 3687[1].
Undecylaldehyde, 2310[2].
$C_{11}H_{22}O_2$ Caprylic acid, α-ethyl-, Me ester, 363[1].
Cyclohexanepropanol, 2(and 4)-methoxy-α-methyl-, 739[5,7].
1,2-Ethanediol, 1-(1,2,2,3-tetramethylcyclopentyl)-, 1399[6].
4-Hendecanone, 5-hydroxy-, 1786[7].
Undecylic acid, *Tl salt*, 2818[1].
$C_{11}H_{22}O_3$ Capric acid, α-hydroxy , Me ester, 768[2].
$C_{11}H_{22}O_6$ *d*-Glucose, pentamethyl-, 2987[8,9].
Glucoside, 2,3,5,6 - tetramethylmethyl-, 1221[3].
$C_{11}H_{22}O_7$ Gluconic acid, pentamethyl-, 581[2].
$C_{11}H_{23}N$ Piperidine, 1-α,α-dimethylbutyl-, 1053[7].
—, 1-(α ethyl-*sec*-butyl)-, 1053[4].
$C_{11}H_{23}NO$ Cyclohexaneëthanol, β-dimethylamino-3-methyl-, *and - HCl*, 904[1].
$C_{11}H_{23}N_3$ Base, b[11] 140°, m. 32–4°, from *N*, *N'*-dibromospiro[piperidine - 1,1' - piperazine-4',1''-piperidine] and NH_3, 2862[8].
$C_{11}H_{23}N_3O$ 4-Octanone, 2,6-dimethyl-, semicarbazone, 407[5].
$C_{11}H_{23}N_3O_2$ 3-Decanone, 4-hydroxy-, semicarbazone, 1786[7].
$C_{11}H_{24}BrNO_2$ α - Carboxyamyltrimethylammonium bromide, Et ester, 3688[8].
$C_{11}H_{24}INO_3$ [α - (Hydroxymethyl)isoamyl]trimethylammonium iodide, acetate, 1271[7].
$C_{11}H_{24}N_2S$ Urea, diamylthio-, 2835[3].
—, diisoamylthio-, 2835[3].
$C_{11}H_{24}N_6NiS_2$ Triaminotripropylaminenickelous thiocyanate, 1589[6].
$C_{11}H_{24}O_2$ 3,4-Decanediol, 3-methyl-, 1786[6].
1,11-Hendecanediol, 1789[1].
Heptanone, di-Et acetal, 2937[8].
$C_{11}H_{24}S_4$ Propane, 1,2,2,3-tetrakis(ethylmercapto)-, 737[2].
$C_{11}H_{26}INO_3$ (γ,γ-Diethoxy-α-methylpropyl)trimethylammonium iodide, 1788[6].
$C_{12}Fe_5N_{12}$ (See also *Ferrous ferricyanide.*)
Turnbull's blue, 1186[8].
$C_{12}H_3Cl_{18}Fe_2O_5$ + $7H_2O$, 1769[4].
$C_{12}H_4Cl_2N_6O_8$ Azobenzene, 5,5'-dichloro-2,4-2',4'-tetranitro-, 750[5].
$C_{12}H_4Cl_4O_3$ Quinone, 2-chloro-6-(2,4,6-trichlorophenoxy)-, 2318[9].
$C_{12}H_4CoN_6O_{14}$, 2296[3].
$C_{12}H_4N_6O_{12}$ Biphenyl, *s*-hexanitro-, 1395[3].
$C_{12}H_5Br_2ClN_2O_2$ 3-Isophenoxazone, 4-amino-2,10-dibromo-8-chloro-, 194[2].
$C_{12}H_5Br_3N_2O_2$ Carbazole, 1,3,6-tribromo-8-nitro-, 1079[8].
3-Isophenoxazone, 4-amino-2,8,10-tribromo-, 194[3].
$C_{12}H_5Br_3N_2O_5$ Ether, 2,4-dinitrophenyl 2,4,6-tribromophenyl, 3694[6].
$C_{12}H_5I_3N_2O_2$ 3-Isophenoxazone, 4-amino-2,8,10-triiodo-, 194[3].
$C_{12}H_5N_3O_{10}$ 2,7-Naphthalenedicarboxylic acid, trinitro-, *and salts*, 1619[6,7].
$C_{12}H_5N_5O_{11}$ Ether, 2,4-dinitrophenyl 2,4,5-trinitrophenyl, 2667[7].

$C_{12}H_5N_7O_{12}$ Diphenylamine, hexanitro-, 2834[6], 3571[1].

$C_{12}H_6As_2I_2N_2O_6$ p-Arsenophenol, 3,3'-diiodo-5,5'-dinitro-, 3289[5].

$C_{12}H_6BrN_3O_7$ Ether, 4-bromo-2-nitrophenyl 2,4-dinitrophenyl, 3694[8].

$C_{12}H_6Br_2Cl_2O_4S_4$ Benzenesulfonyl chloride, 2,2'-dithiobis[5-bromo-, 1797[6].

$C_{12}H_6Br_2N_2O$ Carbazole, 3,6-dibromo-9-nitroso-, 1079[5].

$C_{12}H_6Br_2N_2O_2$ Carbazole, 3,6-dibromo-1-nitro-, 1079[6].

$C_{12}H_6Br_3N$ Carbazole, 1,3,6-tribromo-, 1079[3].

$C_{12}H_6ClN_3O_7$ Ether, 4-chloro-2-nitrophenyl 2,4-dinitrophenyl, 3694[8].

$C_{12}H_6Cl_2N_2O_4$ Biphenyl, 4,4'-dichlorodinitro-, 3292[1,4].

$C_{12}H_6Cl_2N_2O_5$ Ether, 3,5-dichloro-2,4-dinitrophenyl phenyl, 1222[8].

$C_{12}H_6Cl_2O_2$ 2,7-Naphthalenedicarboxylyl chloride, 1619[2].

$C_{12}H_6Cl_4N_2O$ Azoxybenzene, tetrachloro-, 2152[5], 3694[8].

$C_{12}H_6Cl_4O_2$ Hydroquinol, 2-chloro-6-(2,4,6-trichlorophenoxy)-, 2318[9].

$C_{12}H_6N_2$ 2,7-Naphthalenedinitrile, 1618[9].

$C_{12}H_6N_2OS_2$ 1-Naphthol, 2,4(?)-dithiocyano-, 1603[9].

$C_{12}H_6N_2O_4S$ Dibenzothiophene, 2,7-dinitro-, 2155[4].

$C_{12}H_6N_2O_8$ 2,7-Naphthalenedicarboxylic acid, dinitro-, *and di-NH_4 salt*, 1619[5].

$C_{12}H_6O_2$ Acenaphthenequinone, 2491[7], 2852[1].

$C_{12}H_6O_3$ 1,2-β-Naphthofurandione, 597[8].

$C_{12}H_6O_{12}$, Mellitic acid, 3071[3]

$C_{12}H_7AsCl_2O$ Phenoxarsine, dichloro-, 176[2].

$C_{12}H_7Br$ Naphthalene, 1-(bromoethinyl)-, 1783[2].

$C_{12}H_7BrClNO_3$ Ether, 4-bromo-2-nitrophenyl p-chlorophenyl, 3694[9].

—, p-bromophenyl 4-chloro-2-nitrophenyl, 3694[8].

$C_{12}H_7BrN_2O_2$ 3-Isophenoxazone, 4-amino-8-bromo-, 194[2].

$C_{12}H_7Br_2NO_3$ Ether, 4-bromo-2-nitrophenyl p-bromophenyl, 3694[9].

$C_{12}H_7Br_3N_2$ Carbazole, 1-amino-3,6,8-tribromo-, 1079[8].

$C_{12}H_7ClN_2O_5$ Ether, p-chlorophenyl 2,4-dinitrophenyl, 3694[7].

$C_{12}H_7Cl_2NO_3$ Ether, 4-chloro-2-nitrophenyl p-chlorophenyl, 3694[9].

$C_{12}H_7Co_2N_4O_{11}$, 2296[4].

$C_{12}H_7I$ Naphthalene, 1-iodoethinyl-, 1783[4].

$C_{12}H_7IN_4O$ Compd. from 2,3-diaminophenazine and HIO_3, 1239[4].

$C_{12}H_7I_2N$ Carbazole, diiodo-, 1805[2].

$C_{12}H_7NO_2S$ 2-α-Naphthisothiazolecarboxylic acid, 763[7].

$C_{12}H_7NO_3$ 1,3,2-β-Naphthoxazine-2,4(3)-dione, 1616[4].

$C_{12}H_7N_3O_2$ 4,10-Phenantholine, 6-nitro-, 2325[8]

$C_{12}H_7N_3O_3$ 2-Phenazinol, nitro-, 603[4,7].

$C_{12}H_7N_3O_5$ Ketone, 2,4-dinitrophenyl 2-pyridyl, 204[5].

$C_{12}H_7N_3O_7$ Ether, 2,4-dinitrophenyl nitrophenyl, 3694[8].

Furan, 2-(2,4,6-trinitrostyryl)-, 3001[9].

$C_{12}H_7N_3S_2$ 1-Naphthylamine, 2,4(?)-dithiocyano-, 1603[7].

$C_{12}H_7N_5$ 1,3-Triazolophenazine(?), 1805[7].

$C_{12}H_7NaO_6S_2$ Sultone from diazo compd. of 4-amino-3-acenaphthenesulfonic acid, 411[3].

$C_{12}H_8AsClO_3$ 3(and 4)-Chloro-6-hydroxyphenoxarsonium oxide, 176[2].

$C_{12}H_8AsClS$ Phenothiarsine, 10-chloro-, 2839[3].

$C_{12}H_8AsCl_3$ Arsine, bis(p-chlorophenyl)chloro-, 393[5].

$C_{12}H_8AsCl_3O$ Arsine, dichloro[(chlorophenoxy)-phenyl]-, 176[1,2].

$C_{12}H_8AsIO$ Phenoxarsine, 6-iodo-, 2839[4].

$C_{12}H_8BrKO_3$ 2-Naphthoic acid, 4-bromo-3-hydroxy-, Me ester, K deriv., 910[9].

$C_{12}H_8BrNO_3$ Ether, p-bromophenyl o(and p)-nitrophenyl, 3694[8].

$C_{12}H_8BrNaO_3$ 2-Naphthoic acid, 4-bromo-3-hydroxy-, Me ester, Na deriv., 910[9].

$C_{12}H_8BrO_3Rb$ 2-Naphthoic acid, 4-bromo-3-hydroxy-, Me ester, Rb deriv., 910[9].

$C_{12}H_8Br_2$ Biphenyl, 3,5-dibromo-, 1800[9].

$C_{12}H_8Br_2Hg$ Benzene, 1,1'-mercuribis[4-bromo-, 177[3].

$C_{12}H_8Br_2N_2$ Carbazole, 1-amino-3,6-dibromo-, 1079[6].

$C_{12}H_8Br_2OTe$ Phenoxtellurine, dibromide, 1064[1].

$C_{12}H_8Br_2O_6S_4$ Benzenesulfonic acid, 2,2'-dithiobis[5-bromo-, *di-K salt*, 1797[6].

$C_{12}H_8Br_3N$ Xenylamine, 2,4',6-tribromo-, 1800[9].

$C_{12}H_8ClIN_2O_4$ Bis(m-nitrophenyl)iodonium chloride, 585[5].

$C_{12}H_8ClIN_2O_8$ Bis(m-nitrophenyl)iodonium perchlorate, 585[6].

$C_{12}H_8ClNO_3$ Ether, chloronitrophenyl phenyl, 176[2], 3694[8].

—, chlorophenyl nitrophenyl, 175[9], 3694[8].

$C_{12}H_8ClN_3O_2Se$ 4-Nitro-1-phenylselenolium chloride, 2498[8].

$C_{12}H_8ClN_3O_3Se$ 1-(p-Hydroxyphenyl)-4-nitropiaselenolium chloride, 2498[7].

$C_{12}H_8ClN_3O_4$ Xenylamine, 4'-chloro-2,3'-nitro-, 3292[2].

$C_{12}H_8Cl_2$ Biphenyl, 3,4-dichloro-, 1800[8].

$C_{12}H_8Cl_2Hg$ Benzene, 1,1'-mercuribis[4-chloro-, 177[3].

$C_{12}H_8Cl_2Hg_2N_2$ Aniline, dimercuribis[6-chloro-, 589[5,6].

$C_{12}H_8Cl_2N_2Se$ 4-Chloro-1-phenylselenolium chloride, 2498[8].

$C_{12}H_8Cl_2OTe$ Phenoxtellurine, dichloride, 1063[9].

$C_{12}H_8Cl_3N$ Xenylamine, 2,4',6,-trichloro-, 1800[9].

$C_{12}H_8Cl_4HgN_2$ Aniline, 2,2'-mercuribis[4,6-dichloro-, 2317[8].

$C_{12}H_8CoN_2O_6$, 2296[1].

$C_{12}H_8HgN_2O_4$ Benzene, 1,1'-mercuribis[2-nitro-, 177[2], 2837[9].

$C_{12}H_8IN_3O_7$ Bis(m-nitrophenyl)iodonium nitrate, 585[5].

$C_{12}H_8I_2N_2O_4$ Bis(m-nitrophenyl)iodonium iodide, 585[6].

$C_{12}H_8I_2OTe$ Phenoxtellurine, diiodide, 1064[1].

$C_{12}H_8K_2MoO_6 + 2H_2O$ Potassium dipyrocatecholatomolybdate, 3405[8].

$C_{12}H_8N_2OS$ 2-α-Naphthisothiazolecarboxamide, 763[8].

$C_{12}H_8N_2O_2$ Naphthalic acid, cyclic hydrazide, 1075[3].

2,8-Phenazinediol, 603[6].

$C_{12}H_8N_2O_3$ Ketone, p-nitrophenyl 2(and 4)-pyridyl, 204[2,4].

$C_{12}H_8N_2O_3S$ Diazo compd. from 3-amino-1-acenaphthenesulfonic acid, 411[4].

$C_{12}H_8N_2O_3SSe$ 1-Phenyl-4-sulfopiaselenolium hydroxide, cyclic ester, 2498[7].

$C_{12}H_8N_2O_4$ 2-Pyridol, p-nitrobenzoate, 1413[1].

$C_{12}H_8N_2O_4SSe$ 1-(p-Hydroxyphenyl)-4-sulfopiaselenolium hydroxide, cyclic ester, 2498[7].

$C_{12}H_8N_2O_5$ Ether, 2,4-dinitrophenyl phenyl, 2319[7], 3694[7].
$C_{12}H_8N_2O_6$ 1-Naphthaleneacetic acid, 2,4-dinitro-, 2325[3].
$C_{12}H_8N_2O_7Te$ Phenoxtellurine, dinitrate, 1064[1].
$C_{12}H_8N_4O_5$ Azoxybenzene, *p,p'*-dinitro-, 174[9].
$C_{12}H_8N_4O_{10}Pb$ Bis(*m*-nitrophenyl)lead dinitrate, 585[6].
$C_{12}H_8O$ 7-Acenaphthenone, 3010[7].
$C_{12}H_8OTe$ Phenoxtellurine, 1063[9].
$C_{12}H_8O_3S_2$ Thianthrenesulfonic acid, *and Na salt*, P 3061[7].
$C_{12}H_8O_4$ 2,7-Naphthalenedicarboxylic acid, *and salts*, 1618[9], 1619[1,2].
2-Naphthaleneglyoxylic acid, 1-hydroxy-, *and Ba salt*, 593[9].
$C_{12}H_8S$ Dibenzothiophene, *and -HNO_3*, 2155[2].
$C_{12}H_9AgO_3$ 2-Naphthoic acid, 3-hydroxy-, Me ester, Ag deriv., 910[9].
$C_{12}H_9AsBrNO_4$ Arsinic acid, (*o*-bromophenyl)-(*o*-nitrophenyl)-, 1606[4].
$C_{12}H_9AsClN$ Phenarsazine, 1-chloro-1,6-dihydro-, *and $AsCl_3$ addn. compd.*, 1606[3,8].
$C_{12}H_9AsCl_2S$ Arsine, dichloro(*o*-phenylmercaptophenyl)-, 2839[3].
$C_{12}H_9BIO_4$, 717[7].
$C_{12}H_9BrO$ Ether, *p*-bromophenyl phenyl, 3694[7].
$C_{12}H_9BrO_3$ 2-Naphthoic acid, 4-bromo-3-hydroxy-, Me ester, 910[9].
α,γ-Pentadienaldehyde, *γ*-bromo-*δ*-hydroxy-, benzoate, 741[9].
$C_{12}H_9Br_2N$ Xenylamine, 2,6-dibromo-, 1800[9].
$C_{12}H_9Cl$ Acenaphthene, 2-chloro-, 411[1].
$C_{12}H_9ClHgN_2O_4S$ Benzenesulfonic acid, (3-chloromercuri-4-hydroxyphenylazo)-, *Na salt*, 1605[6].
$C_{12}H_9ClHgS$ Sulfide, *p*-chloromercuriphenyl phenyl, 1605[7].
$C_{12}H_9ClN_2Se$ 1-Phenylpiaselenolium chloride, 2498[6].
$C_{12}H_9ClO$ 2-Acetonaphthone, *α*-chloro-, 411[1].
$C_{12}H_9ClO_2$ 2-Naphthoyl chloride, 3(and 6)-methoxy-, 1616[9], 1617[1].
$C_{12}H_9ClO_3$ Chromone, 3-acetyl-6-chloro-2-methyl-, 1237[9].
2-Naphthoic acid, 4-chloro-3-hydroxy-, Me ester, 1616[4].
$C_{12}H_9Cl_3OTe$ *p*-Phenoxyphenyltellurium trichloride, 1063[8].
$C_{12}H_9CuNO_3$ Ketone, 2-furyl *α*-hydroxybenzyl, oxime, Cu deriv., 1055[7].
$C_{12}H_9IO_3$ *α,γ*-Pentadienaldehyde, *δ*-hydroxy-*γ*-iodo-, benzoate, 742[1].
$C_{12}H_9I_4N_2$ Compd. from *N*-phenyl-*o*-phenylenediamine and HIO_3, 1239[4].
$C_{12}H_9KO_3$ 2-Naphthoic acid, 3-hydroxy-, Me ester, K deriv., 910[9].
$C_{12}H_9MoO_8Tl$ Thallium dipyrogallolmolybdate, 557[2].
$C_{12}H_9N$ Carbazole, P 768[9], P 3697[7].
$C_{12}H_9NO$ Biphenyl, *p*-nitroso-, 587[3].
2-Naphthonitrile, 3-methoxy-, 910[8].
$C_{12}H_9NO_2$ 2-Pyridol, benzoate, 1413[1].
$C_{12}H_9NO_3$ Ether, *p*-nitrophenyl phenyl, 3694[7].
$C_{12}H_9NO_4$ Phenol, 2-nitro-4-phenoxy-, 1608[9].
$C_{12}H_9NO_4S_2$ *o*-Benzenedisulfonimide, *N*-phenyl-, 3289[9].
$C_{12}H_9NO_6S$ 3-Acenaphthenesulfonic acid, 4-nitro-, *Na salt*, 411[2].
$C_{12}H_9NS$ Dibenzothiophene, amino-, 2155[2].
$C_{12}H_9N_3O$ 2-Phenazinol, amino-, *and salts*, 603[6,7].
5-Pyrimidinenitrile, 1,4-dihydro-4-keto-2-*p*-tolyl-, 206[5].
$C_{12}H_9N_3O_2$ 5-Pyrimidinenitrile, 2-*p*-anisyl-1,4-dihydro-4-keto-, 206[5].
$C_{12}H_9N_3O_4$ Dipicolinic acid, 4-(4-pyridylamino)-, 1238[7].
Pyridine, 2-(2,4-dinitrobenzal)-1,2-dihydro-, 204[5].
—, 2(and 4)-(2,4-dinitrobenzyl)-, *and chloroplatinate*, 204[4,6].
Quinonimine, *N*-(2-amino-4-nitrophenyl)-2-hydroxy-, 603[8].
$C_{12}H_9N_3O_5$ Phenol, 4-(4-amino-3-nitrophenyl)-2-nitro-, 3292[3].
—, *p*-(2,4-dinitroanilino)-, 3452[6].
$C_{12}H_9N_3O_5S_2$ Rhodanine, 5-(2,4-dinitrobenzal)-3-ethyl-, 1627[5].
$C_{12}H_9N_3O_6$ Hydroxylamine, *β*-(2,4-dinitro-5-phenoxyphenyl)-, *and addn. compds.*, 2667[6,7].
$C_{12}H_9N_3S$ See *Thionin*.
$C_{12}H_9N_5O_4$ Triazene, 1,3-bis(*m*-nitrophenyl)-, 372[2].
$C_{12}H_9N_9O_4S_2$ Benzenesulfonyl azide, *p,p'*-aziminobis-, 1409[8].
$C_{12}H_9NaO_2$ 2-Acetonaphthone, 3-hydroxy-, Na deriv., 1616[9].
$C_{12}H_9NaO_3$ 2-Naphthoic acid, 3-hydroxy-, Me ester, Na deriv., 910[9].
$C_{12}H_9O_3Rb$ 2-Naphthoic acid, 3-hydroxy-, Me ester, Rb deriv., 910[9].
$C_{12}H_{10}$ See *Acenaphthene; Biphenyl.*
$C_{12}H_{10}AsCl$ Arsine, chlorodiphenyl, 2552[4].
$C_{12}H_{10}AsClO_4$ Benzenearsonic acid, chlorophenoxy-, 1761[1,2].
$C_{12}H_{10}AsN_2O_9S$ Arsanilic acid, 3-nitro-*N*-(*m*-nitrophenylsulfonyl)-, 2838[8].
$C_{12}H_{10}As_2$ Arsenobenzene, 2993[4].
$C_{12}H_{10}As_2I_2N_2O_2$ *p*-Arsenophenol, 3,3'-diamino-5,5'-diiodo-, 1607[4].
$C_{12}H_{10}BeO_6S_2$ + $4H_2O$ Beryllium benzenesulfonate, 3141[5].
$C_{12}H_{10}BINO_7$, 717[7].
$C_{12}H_{10}BrN$ Xenylamine, 4'-bromo-, 1800[9].
$C_{12}H_{10}BrN_3O$ Naphthaldehyde, bromo-, semicarbazone, 1216[4,5].
$C_{12}H_{10}Br_2O_4$ Pyruvic acid, bromo(bromoanisal)-, methyl ester, 3164[8].
$C_{12}H_{10}ClN$ Xenylamine, chloro-, 2848[2]; *-HCl*, 1800[3].
$C_{12}H_{10}ClNO$ Aniline, chlorophenoxy-, *and -HCl*, 175[9], 1761[1,2].
$C_{12}H_{10}ClN_3$ Benzaldehyde, 6-chloro-3-pyridylhydrazone, 764[4].
$C_{12}H_{10}Cl_2HgN_2$ Aniline, 4,4'-mercuribis[2-chloro-, 589[8].
$C_{12}H_{10}Cl_2N_2O_7$ *α*-Toluic acid, *α*-acetyl-3,5-dichloro-2,4-dinitro-, Et ester, 1222[9].
$C_{12}H_{10}Cl_2N_4O$ Benzazimidole, 5,6-dichloro-, $PhNH_2$ salt, 750[7].
$C_{12}H_{10}Cl_2Si$ Silicane, dichlorodiphenyl-, 1185[9].
$C_{12}H_{10}Hg$ Mercury diphenyl, 1605[4].
$C_{12}H_{10}INO_3$ Diphenyliodonium nitrate, 584[5].
$C_{12}H_{10}I_2N_2O$ Compd. from *N*-phenyl-*o*-phenylenediamine and HIO_3, 1239[4].
$C_{12}H_{10}KO_4P$ Phenyl potassium phosphate, 3704[5].
$C_{12}H_{10}K_2MoO_8$ + $5H_2O$ Potassium dipyrogallolmolybdate, 3405[7].
$C_{12}H_{10}N_2$ Azobenzene, 1062[6,7], 1224[5], 2485[8,9].
β-Naphthisopyrazole, 1616[8].
$C_{12}H_{10}N_2O$ Azoxybenzene, 174[8], 1062[4,5,6].
Diphenylamine, *N*-nitroso-, 2834[9].
Phenol, azophenyl-, 1178[4].
$C_{12}H_{10}N_2O_2$ Pyridine, 2(and 4)*p*-nitrobenzyl-, 204[3,6].

$C_{12}H_{10}N_2O_3$ Ether, 4-amino-2-nitrophenyl phenyl, 1142[5].
Indole, 1-acetyl-3-(β-nitrovinyl)-, 758[8].
$C_{12}H_{10}N_2O_4$ 1,4-Phthalazinediol, diacetate, 185[5].
1(2)-Phthalazone, 2-acetyl-4-hydroxy-, acetate, 185[5].
5-Pyrimidinecarboxylic acid, 2-*p*-anisyl-1,4-dihydro-4-keto-, 206[5].
$C_{12}H_{10}N_2O_5$ Ether, 2,4-dinitro-1-naphthyl ethyl, 2677[1].
$C_{12}H_{10}N_2O_5S$ Benzenesulfonic acid, 2-amino-5-nitro-, Ph ester, P 917[5].
$C_{12}H_{10}N_2O_6Pb$ Diphenyllead dinitrate, 584[6].
$C_{12}H_{10}N_2O_6S$ 1(or 2)-Naphthalenesulfonic acid, 5-acetamido-8-nitro-, P 423[7].
$C_{12}H_{10}N_2O_6S_2$ Benzenesulfonic acid, azobis-, 3161[7].
$C_{12}H_{10}N_2S$ Dibenzothiophene, 2,7-diamino-, 2155[4,5].
$C_{12}H_{10}N_2S_2$ Quinrhodine, 3-ethyl-, 1627[5].
$C_{12}H_{10}N_4O_4$ *m*-Phenylenediamine, 4,6-dinitro-N^1-phenyl-, 590[8].
$C_{12}H_{10}N_4O_8$ Pyridine, 3-methoxypicrate, 1394[9].
Guaiacol, 4,5,6-trinitro-, pyridine salt, 1395[1].
$C_{12}H_{10}N_6O_9$ Pyridine, 1,2-dihydro-2-imino-5-nitro-, picrate, 396[6].
$C_{12}H_{10}O$ 7-Acenaphthenol, 2852[4], 3010[6].
Phenyl ether, 1544[3], 2835[1].
$C_{12}H_{10}OS$ Phenyl sulfoxide, 1784[2].
$C_{12}H_{10}O_2$ Acetonaphthone, hydroxy-, 1616[9], 2159[1].
$C_{12}H_{10}O_3$ Chromone, 3-acetyl-2-methyl-, 1237[1].
2,7-Naphthalenediol, acetate, 911[1].
1-Naphthaleneglycolic acid, 2851[9].
Naphthoic acid, 3-hydroxy-, Me ester, 1233[4].
—, 3-methoxy-, 910[6], 1233[4].
α,γ-Pentadienaldehyde, δ-hydroxy-, benzoate, 741[6].
$C_{12}H_{10}O_3S$ Phenyl sulfite, 3694[1].
$C_{12}H_{10}O_4$ Chromone, acetylhydroxy-2-methyl-, 1237[6].
Quinhydrone, 522[9], 713[5], 3249[7], 3378[2].
$C_{12}H_{10}O_5$ 1,2-Benzopyran-4-acetic acid, 7-hydroxy-2-keto-5-methyl-, 909[1].
$C_{12}H_{10}O_5S$ 1-Naphthol-4-sulfonic acid, 2-acetyl-, 1617[4].
$C_{12}H_{10}S$ Phenyl sulfide, 1605[8].
$C_{12}H_{11}AsBrNO_2$ Arsinic acid, (*o*-aminophenyl)-(*o*-bromophenyl)-, 1606[4].
$C_{12}H_{11}AsN_2O_7S$ Arsanilic acid, *N*-(*m*-nitrophenylsulfonyl)-, 2838[7].
$C_{12}H_{11}AsN_2O_8S$ Arsanilic acid, hydroxy-*N*-(*m*-nitrophenylsulfonyl)-, 2838[8], 2839[1].
$C_{12}H_{11}AsO_3S$ Benzenearsonic acid, *o*-phenylmercapto-, 2839[3].
$C_{12}H_{11}BrN_2O_2$ Compd. from *N*-phenyl-*o*-phenylenediamine and $HBrO_3$, 1239[5].
Pyrazolecarboxylic acid, 1-benzyl-4-bromomethyl-, 3006[4,5].
$C_{12}H_{11}ClN_2O_3$ Succinimide, α-benzamido-*N*-(chloromethyl)-, 49[9].
$C_{12}H_{11}ClO_2$ Chromone, chloroethylmethyl-, 1237[7].
Coumarin, 6-chloro-3-ethyl-4-methyl-(?), 1238[1].
—, 6-chloro-3,4,7-trimethyl-, 1238[3].
$C_{12}H_{11}ClO_4$ 1-Isobenzofuranacetyl chloride, 1,2-dihydro-2-keto-4,5-dimethoxy-, 2331[3].
$C_{12}H_{11}Cl_2N_3O_2$ Indazole, 7-(α-chloroacetamido)-2-chloroacetyl-5-methyl-, 2498[1].
$C_{12}H_{11}IN_2O_2$ Compd. from *N*-phenyl-*o*-phenylenediamine and HIO_3, 1239[4].
$C_{12}H_{11}I_2N$ Pyrrole, 3,4-diiodo-2,5-dimethyl-1-phenyl-, 597[3].
$C_{12}H_{11}N$ (See also *Diphenylamine.*)
Acenaphthenamine, *and* ·*HCl*, 410[8,9], 411[1].
Xenylamine, 1800[6], 2848[2].
$C_{12}H_{11}NO$ *p*-Cresol, α-2(and 4)-pyridyl-, 204[9].
Hydroxylamine, β-(*p*-phenylphenyl)-, 587[9], 2992[4]; *and* ·*HCl*, 2848[1].
Phenol, *p*-(*p*-aminophenyl)-, 1552[3,4].
$C_{12}H_{11}NO_2$ Acetanilide, *N*-(8-hydroxy-1-naphthyl)-, 1073[6].
1-Naphthalenecarbamic acid, Me ester, 1232[8].
1-Naphthaleneglycolamide, 2851[9].
2-Naphthamide, methoxy-, 910[8], 1617[1].
$C_{12}H_{11}NO_3$ 2-Indannitrile, 1-keto-5,6-dimethoxy-, 2326[2].
Isatin, 4,6-dimethyl-, acetate, 2681[5].
Ketone, 2-furyl α-hydroxybenzyl, oxime, 1055[6].
—, 2-hydroxy-8-methoxy-3-quinolyl methyl, 402[6].
2-Naphthalenecarbamic acid, 3-hydroxy-, Me ester, 1616[5].
3-Quinaldinecarboxylic acid, 8-methoxy-, *and salts*, 402[6].
$C_{12}H_{11}NO_3S$ Acenaphthenesulfonic acid, amino-, *Na salt*, 411[3].
$C_{12}H_{11}NO_4$ 3-Quinaldinecarboxylic acid, 4-methoxy-, *N*-oxide, 1079[4].
$C_{12}H_{11}NO_5$ 3-Indoleacetic acid, 2-carboxymethoxy-, 1604[7].
$C_{12}H_{11}NO_6S_2$ 2,4-Acenaphthenedisulfonic acid, 3-amino-, *di-Na salt*, 411[3].
$C_{12}H_{11}N_2NaO_3$ Sodium phenobarbital, 1851[2].
$C_{12}H_{11}N_2O_2P$ Benzodiazphospholium, phenoxy-*P*-oxodihydro-, 913[9].
$C_{12}H_{11}N_3$ Aniline, phenylazo-, 326[9], 1062[7], 2485[6], 2835[8].
Benzaldehyde, 4-pyridylhydrazone, 1807[9].
Triazene, 1,3-diphenyl-, *and salts*, 2485[6,7,8].
$C_{12}H_{11}N_3O_2$ 1,2,3-Triazole-4-acrylic acid, 5-methyl-1-phenyl-, 416[8].
$C_{12}H_{11}N_3O_3S$ Hydantoin, 1-(*N*-benzoylglycyl)-2-thio-, 3299[1].
$C_{12}H_{11}N_3O_4$ 3,4-Pyrazoledicarboxylic acid, 1-(*p*-aminophenyl)-5-methyl-, 598[9].
Pyrrole, 2,5-dimethyl-3,4-dinitro-1-phenyl-, 597[5].
$C_{12}H_{11}N_3O_5$ 1-Isobenzofuranacetyl azide, 1,2-dihydro-2-ketodimethoxy-, 2331[1,3].
$C_{12}H_{11}N_5O_7$ Pyridine, 1,4-dihydro-4-imino-1-methyl-, picrate, 396[2].
—, 4-methylamino-, picrate, 396[2].
$C_{12}H_{12}$ Naphthalene, dimethyl-, 1179[1].
$C_{12}H_{12}AlF_6N_3 + H_2O$, 719[6].
$C_{12}H_{12}AsNO_3$ Arsanilic acid, *N*-phenyl-, 1606[8].
$C_{12}H_{12}As_2O_6S_2$ Benzenearsonic acid, *p*,*p*′-dithiobis-, *and Ba salt*, 2839[2].
$C_{12}H_{12}BrClO_6$ Hydroquinol, 2-bromo-6-chloro-3,5-dimethoxy-, diacetate, 3695[1].
$C_{12}H_{12}BrHg_2NO_5$ Acetanilide, 2(or 4)-bromo-4,6-(or 2,6)-bis(acetoxymercuri)-, 3162[6].
$C_{12}H_{12}Br_2HgN_2$, 3665[1].
$C_{12}H_{12}Br_2O_4$ Butyric acid, anisyldibromoketo-, methyl ester, 3164[7].
$C_{12}H_{12}ClHg_2NO_5$ Acetanilide, 2,4(and 4,5)-bis-(acetoxymercuri)-6(and 2)-chloro-, 589[4,5].
$C_{12}H_{12}ClHg_3NO_6$ Aniline, 2,4,6-tris(acetoxymercuri)-3-chloro-, 2838[2].
$C_{12}H_{12}ClN$ 1-Benzylpyridinium chloride, 3008[9].
$C_{12}H_{12}Cl_2HgN_2$, 3665[1].
$C_{12}H_{12}Cl_4O_3$ Compd., m. 164–5°, from compd.

from 2,4-cresotic acid, Cl_3CCHO, and H_2SO_4, *and Ca salt*, 40[9].
$C_{12}H_{12}HgI_2N_2$, 3665[1].
$C_{12}H_{12}N_2$ (See also *Benzidine.*)
m,m'-Bianiline, 1938[2].
Pyridine, 2(and 4)-(*p*-aminobenzyl)-, *and -HCl*, 204[5,6].
$C_{12}H_{12}N_2O$ Acetonaphthone, hydroxy-, hydrazone, 1616[8,9].
Ether, 2,4-diaminophenyl phenyl, 1142[5].
Propiolic acid, phenyl-, isopropylidenehydrazide, 2157[4].
Urea, α-methyl-β-1-naphthyl-, 2319[5].
$C_{12}H_{12}N_2OS_2$ Anisole, *p*-(α,β-dithiocyanopropyl)-, 1604[1].
4(5)-Thiazolone, 5-(anilinomethylene) 2-(ethylmercapto)-, 600[8].
$C_{12}H_{12}N_2O_2$ Pyrazolecarboxylic acid, 1-benzylmethyl-, 3000[4,5].
—, dimethylphenyl-, 2493[7,8].
—, 3(or 5)-methyl-5(or 3)-phenyl-, Me ester, 2856[6,7].
$C_{12}H_{12}N_2O_3$ See *Phenobarbital.*
$C_{12}H_{12}N_2O_4$ Imidazole, 1-methyl-2-phenyl-, oxalate, 395[7].
3-Indolecarbinol, 1-acetyl-α-(nitromethyl)-, 758[8].
1,3-Isoindazoledicarboxylic acid, Et Me ester, 2496[7].
Succinimide, α - benzamido-*N*-(hydroxymethyl)-, 49[9].
$C_{12}H_{12}N_2O_6$ Diacetanilide, 2-hydroxy-4-nitro, acetate, 2318[3].
$C_{12}H_{12}N_2S$ *m*-Phenylenediamine, 4-phenylmercapto-, 1142[6].
Urea, α-methyl-β-1-naphthylthio-, 2835[3].
$C_{12}H_{12}N_2S_2$ Aniline, *o,o'*-dithiobis-, 600[1].
Urea, α-phenyl-β-2-thienylmethylthio-, 390[7].
$C_{12}H_{12}N_3NaO_5S$ 1,2,3-Triazole-4-carboxylic acid, 1-benzylsulfonyl-5-hydroxy-, Et ester, Na deriv., 1409[2].
—, 5-hydroxy-1-*p*-tolylsulfonyl-, Et ester, Na deriv., 1408[8].
$C_{12}H_{12}N_3OP$ Benzodiazphospholium, anilino-*P*-oxodihydro-, 914[1].
$C_{12}H_{12}N_4O_8S$ Thiazole, 5-ethoxy-2-methyl-, picrate, 2679[8].
$C_{12}H_{12}O$ Ether, ethyl naphthyl, 2555[2].
$C_{12}H_{12}O_2$ Chromone, 2,5,7-trimethyl-, *and -HCl*, 1237[1,4].
$C_{12}H_{12}O_2Te$ 1,2-Telluropyran-3,5-(4,6)-dione, 2-benzyl-, 413[9].
$C_{12}H_{12}O_3$ Chromone, 7-methoxy-2,3-dimethyl-, 3454[8].
1(2)-Naphthalenone, 3,4-dihydro-2-hydroxy-, acetate, 383[4].
$C_{12}H_{12}O_4$ Pyruvic acid, anisal-, methyl ester, 3164[7].
$C_{12}H_{12}O_5$ Acetophenone, α,4-dihydroxy-, diacetate, 3457[6].
$C_{12}H_{12}O_6$ 1,2,4-Benzenetriol, triacetate, 178[1].
1-Isobenzofuranacetic acid, 1,2-dihydro-2-keto-4,5-dimethoxy-, 2331[2].
$C_{12}H_{12}O_7P_2$ Phenyl pyrophosphate, 3704[4].
$C_{12}H_{12}O_8$ Acetophenone, bis(carboxyoxy)hydroxy-, di-Me ester, 375[7].
$C_{12}H_{13}AsN_2O_4S$ Arsanilic acid, *N*(*m*-aminophenylsulfonyl)-, *and -HCl*, 2838[8].
$C_{12}H_{13}AsN_2O_5S$ Arsanilic acid, *N*-(*m*-aminophenylsulfonyl)hydroxy-, *and salts*, 2838[9], 2839[1].
$C_{12}H_{13}AuCl_4O_2$ 7-Methoxy-2,4-dimethylbenzopyrylium chloroaurate, 2498[9].
$C_{12}H_{13}BrIN$ 2-Bromo-1-ethyl-6-methylquinolinium iodide, 205[4].
$C_{12}H_{13}BrO$ Compd. from dicyclopentadiene, AcOH and Br, 2148[5].
$C_{12}H_{13}BrO_4$ Isoapiol, 6-bromo-, 3450[2].
$C_{12}H_{13}BrO_5$ Anisic acid, 5-bromo-2-hydroxy-, Et ester, acetate, 3004[6].
Ethylene oxide, α-(2-bromo-5,6-dimethoxy-3,4-methylenedioxyphenyl)-β-methyl-, 3450[2].
$C_{12}H_{13}ClN_4O_6$ Acetoacetic acid, Et ester, 5-chloro-2,4-dinitrophenylhydrazone, 750[5].
$C_{12}H_{13}ClO_3$ Propiophenone, 5-chloro-2-hydroxy-, propionate, 1237[6].
Valeric acid, δ-*p*-chlorobenzoyl-, 1229[4].
$C_{12}H_{13}Cl_3O_2$ 2-Pentanol, 1-trichloro-, benzoate, 1218[1].
$C_{12}H_{13}Hg_2NO_5$ Acetanilide, 2,4-bis(acetoxymercuri)-, 2318[2].
$C_{12}H_{13}N$ 1-Naphthylamine, *N,N*-dimethyl-, 384[9].
—, *N*-ethyl, 384[9].
Quinoline, 1,2(or 1,4)-dihydro-1,4(or 1,2)-dimethyl-2(or 4)-methylene-, 2862[1].
$C_{12}H_{13}NOS$ Thiazole, 5-ethoxy-4-methyl-2-phenyl-, 2679[7].
$C_{12}H_{13}NO_2$ Isatin, 1,4,5,7-tetramethyl-, 2681[6].
1,3,4-Oxazine, 6-ethoxy-2-phenyl-, 2502[4].
2,3-Quinolinediol, 5,6,8-trimethyl-, 2681[5].
$C_{12}H_{13}NO_3$ Cinchomeronic anhydride, 6-*tert*-butyl-2-methyl-, 3296[9].
Cinnamaldehyde, oxime, carbethoxy deriv., 179[6].
α-Pentenanilide, α-hydroxy-*N*-methyl-, 2823[1].
α-Pentenic acid, γ-keto-α-(*N*-methylanilino)-, 2823[2].
Valeranilide, α,γ-diketo-*N*-methyl-, 2823[1].
$C_{12}H_{13}NO_5$ 1-Isobenzofuranacetamide, 1,2-dihydro 2-ketodimethoxy-, 2330[9], 2331[2].
4 Pyranol, tetrahydro-, *p*-nitrobenzoate, 1624[5].
$C_{12}H_{13}NO_6$ Cinnamic acid, 2-ethoxy-3-methoxy-5-nitro-, 1793[1].
p-Toluic acid, α-hydroxy-3-nitro-, Et ester, acetate, 379[1].
$C_{12}H_{13}NO_6W$ Ammonium dipyrocatecholtungstate, 557[3].
$C_{12}H_{13}NO_8W$ Ammonium dipyrogalloltungstate, 557[3].
$C_{12}H_{13}N_3O$ Pyrazolecarboxanilide, 1,4-dimethyl-, 2857[2,3].
$C_{12}H_{13}N_3OS_2$ Rhodanine, 5-(2,4-diaminobenzal)-3-ethyl-, 1627[6].
$C_{12}H_{13}N_3O_2$ Indazole, 7-acetamido-2-acetyl-5-methyl-, 2496[9].
Isoindazole, 7-acetamido-1-acetyl-5-methyl-, 2496[9].
Pyrazole, 3,4,5-trimethyl-1-(*p*-nitrophenyl)-, 761[8].
4(3)-Quinazolone, 3-acetamido-2-ethyl-, 207[1].
—, 2-methyl-3-propionylamino-, 207[1].
$C_{12}H_{13}N_3O_3$ Δ^2-Cyclopentenone, 2-hydroxy-3-methyl-, *p*-nitrophenylhydrazone, 2484[8].
$C_{12}H_{13}N_3O_4$ Isobenzoxdiazine, 3-α-methylisobutyryl-7-nitro-, 360[3].
$C_{12}H_{13}N_3O_5S$ Malonamic acid, *N*-benzylsulfonyl-α-diazo-, Et ester, 1409[3].
1,2,3-Triazole-4-carboxylic acid, 1-benzylsulfonyl-5-hydroxy-, Et ester, 1409[2].
—, 4,5-dihydro-5-keto-1-*p*-tolylsulfonyl-, Et ester, 1408[8].
—, 5-hydroxy-1-*p*-tolylsulfonyl-, Et ester, 1408[8].

$C_{12}H_{13}N_3O_7$ Glucuronic acid, lactone, *p*-nitrophenylhydrazone, 1059[5].
$C_{12}H_{13}N_3S$ 1,4,3-Isothiodiazine, 2-(allylamino)-5-phenyl-, *and* -*HBr*, 416[4].
$C_{12}H_{13}N_5O_7$ Pyrazole, 1-ethyl-3(and 5)-methyl, picrates, 2494[2].
—, 1,3,5-trimethyl-, picrate, 2856[9].
$C_{12}H_{14}$ Cumene, *p*-propargyl-, 587[9].
$C_{12}H_{14}AsN_3O_5S$ Benzenearsonic acid, 3-amino-4-(*m*-aminophenylsulfonamido)-, 2838[8].
$C_{12}H_{14}As_2Cl_2N_2O_2$ See *Arsphenamine*.
$C_{12}H_{14}As_2N_2O_{16}S_4$ Benzenearsonic acid, *N*,*N'*-sulfonylbis[4-hydroxy-2-sulfamino-, *tetra-Ba salt*, 176[6].
$C_{12}H_{14}Br_2O_3$ Caprophenone, 3,5-dibromo-2,4-dihydroxy-, 2995[8].
$C_{12}H_{14}Br_2O_4$ Veratrole, 6-(α,β-dibromopropyl)-3,4-methylenedioxy-, 3450[1].
$C_{12}H_{14}Br_2O_5$ Piperonyl alcohol, 2-bromo-α-(α-bromoethyl)-5,6-dimethoxy-, 3450[2].
$C_{12}H_{14}Cl_4IrN_2$, 2296[1].
$C_{12}H_{14}Cl_5IrN_2$, 2296[1].
$C_{12}H_{14}Cl_6Fe_2NO_{17}$ + $4H_2O$, 1769[4].
$C_{12}H_{14}Cl_7Fe_3O_{18}$ + $9H_2O$, 1769[4].
$C_{12}H_{14}HgI_3N$ Quinoline, complex salt with C_3H_7I and HgI_2, 3695[8,9].
$C_{12}H_{14}IN$ 1-Ethylquinaldinium iodide, 1627[8].
Quinoline, complex salt with Me_2CHI, 3695[7].
p-Toluquinaldine, methiodide, 1627[7].
$C_{12}H_{14}I_3N$ *p*-Toluquinaldine, methiodide, di-iodide, 1627[7].
$C_{12}H_{14}N_2$ Cyanamide, (cyclobutylmethyl) phenyl-, 390[5].
Cyclopentanenitrile, 1-anilino-, 171[9].
Pyrazole, 1-ethyl-3(and 5)-methyl-5(and 3)-phenyl-, 2856[3,4].
$C_{12}H_{14}N_2O_2$ 2-Indazoleacetic acid, α-methyl-, Et ester, 1622[8].
3-Indolecarbinol, 1-acetyl-α-(aminomethyl)-, *salts*, 758[8,9].
1-Isoindazoleacetic acid, α-methyl-, Et ester, 1622[7].
$C_{12}H_{14}N_2O_3$ Benzamide, *N*-Δ²-isopentenyl-*m*-nitro-, 1057[8].
Compd. from 3-acetyl-2,6-dimethylchromone mono-oxime, m. 121–2°, 1411[8]
Cyclopentanecarboxylic acid, 1-*N*-nitroso-anilino-, 171[9].
Glyoxime, methylphenyl-, mono-Me ether, Ac deriv., 747[1].
$C_{12}H_{14}N_2O_4$ 2,4-Pyrroledicarboxylic acid, 5-cyano-3-methyl-, 2159[9].
$C_{12}H_{14}N_2O_5$ Glutaric acid, α-keto-, *o*-anisyl hydrazone, 1604[7].
Meconin, 2-(methylnitrosoaminomethyl)-, 2331[2].
$C_{12}H_{14}N_4$ 1,2,4,5-Benzenetetraamine, *N*-phenyl-, *tri-HCl*, 590[9].
$C_{12}H_{14}N_4O$ *s*-Triazole, 3-propyl-5-salicylalamino-, 3293[8].
$C_{12}H_{14}N_4O_4P_2$ Tetrazdiphosphinium, *P*,*P'*-diphenoxy-*P*,*P'*-dioxotetrahydro-, 914[1].
$C_{12}H_{14}N_6O_{22}$ α-Diamylose, hexanitrate, 380[9].
$C_{12}H_{14}O_2$ Acenaphthenediol, tetrahydro-, 1405[1].
Benzene, *o*-diallyloxy-, 1798[1].
Butenone, ethoxyphenyl-, 194[4], 1611[4,5].
Crotonophenone, β-ethoxy-, 2856[7], 3006[2].
Δ¹-3-Hexenone, 1-salicyl-, 387[8].
Pyrocatechol, 3,6-diallyl-, 1798[1].
$C_{12}H_{14}O_2S$ 2,4-Pentanedione, 3-(*p*-tolylmercapto)-, 3289[8].
$C_{12}H_{14}O_3$ Acetophenone, 4-hydroxy-3-methyl-, propionate, 1238[8].
1,3-Butanedione, 1-(6-hydroxy-2,4-xylyl)-, 1237[1].
Δ¹-3-Pentenone, 1-(4-hydroxy-*m*-anisyl)-, 387[8].
$C_{12}H_{14}O_4$ Apiol, 3449[9].
Cinnamic acid, 2-ethoxy-3-methoxy-, 1793[1].
Isoapiol, 3449[9].
Lactic acid, β-phenyl-, Me ester, acetate, 751[2].
Malonic acid, (γ-phenylpropyl)-, 405[1].
Mandelic acid, Et ester, acetate, 378[2].
Phthalic acid, diethyl ester, 262[9], 1396[4], 1493[6], 3533[4], 3779[3]; mono-Bu ester, *Zn salt*, P 2504[7].
Resorcinol, dipropionate, 1624[5].
—, dipropionyl-, 1624[6,7].
$C_{12}H_{14}O_5$ Ethylene oxide, α-(2,3-dimethoxy-3,4-methylenedioxyphenyl)-β-methyl-, 3450[1]
—, (5,6-dimethoxypiperonyl)-, 3450[1].
Glyoxylic acid, (4-methoxy-6-methyl-*m*-phenetyl)-, 765[3].
Propionic acid, β-(2,4-dimethoxybenzoyl)-, 2996[1].
Propiophenone, 2,3-dimethoxy-4,5-methylenedioxy-, 3450[1].
$C_{12}H_{14}O_6$ Phthalic acid, 3,5-dimethoxy-, di Me ester, 1613[2].
$C_{12}H_{14}O_6S$ Acetic acid, *o*-sulfobenzoyl-, Et Me ester, 1069[3]
$C_{12}H_{14}S$ 1,2-Benzothiopyran, 4-ethyl-6-methyl-, 203[9], 204[1]
—, 4,6,8-trimethyl-, 203[9], 204[1].
$C_{12}H_{15}BrO_2$ Phenethyl alcohol, β-(bromomethyl)-β-methyl-, acetate, 385[5].
$C_{12}H_{15}BrO_3$ Piperonyl alcohol, α-(α-bromoethyl)-5,6-dimethoxy-, 3450[1]
$C_{12}H_{15}Br_2NO_2$ Δ²-Cyclohexene-Δ¹,α-acetic acid, α-cyano-3-methyl-, dibromide, Me ester, 2832[4]
o-Toluic acid, α-cyano-3,4-dihydro-5-methyl-, Me ester, dibromide, 2832[4].
$C_{12}H_{15}ClN_2O_2$ 2-Pentanone, 1-(*p*-chloro-*N*-nitrosoanilino)-4-methyl-, 2837[8]
$C_{12}H_{15}IN_2$ Pyrazole, 1-benzyl-3 (and 5)-methyl-, methiodide, 3006[6]
$C_{12}H_{15}NO$ Benzamide, *N*-(cyclobutylmethyl)-, 390[6]
—, *N*-(β-cyclopropylethyl)-, 3012[4].
Benzonitrile, *o*-(γ-ethoxypropyl)-, 905[4].
$C_{12}H_{15}NO_2$ 1,3,4-Benzoxazin-4-one, 2,3-dihydro-2-isobutyl-, 2674[2].
Δ²-Cyclohexene-Δ¹,α-acetic acid, α-cyano-3-methyl-, Et-ester, 2832[3].
Cyclopentanecarboxylic acid, 1-anilino-, 171[9].
1-Piperidinol, benzoate, 372[3].
Salicylamide, *N*-isoamylidene-, 2673[9].
o-Toluic acid, α-cyano-3,4-dihydro-α,5-dimethyl-, Me ester, 2832[4].
$C_{12}H_{15}NO_3$ (See also *Hydrocotarnine*.)
β-Alanine, *N*-benzoyl-, Et ester, 2502[4].
Salicylamide, *N*-isovaleryl-, 2674[1].
$C_{12}H_{15}NO_4$ Benzoic acid, *p*-nitro-, Am ester, 2322[9].
Carbanilic acid, carboxy-, diethyl ester, 3164[3].
Meconin, 2-(methylaminomethyl)-, *salts*, 2331[2,3].
3-Pyrroleacrylic acid, 5-carbethoxy-2,4-dimethyl-, 1621[1].
Valeric acid, α-benzamido-δ-hydroxy-, 2148[3].

$C_{12}H_{15}NO_5$ Caprophenone, 2,4 - dihydroxy-5-nitro-, 2995[8].
Propionic acid, β - (2,4 - dimethoxybenzoyl)-, oxime, 2996[1].
2,4 - Pyrroledicarboxylic acid, 5 - formyl-3-methyl-, di-Et ester, 2159[9], 2160[3].
p-Toluic acid, α - hydroxy - 3 - nitro-, Bu ester, 379[1].
$C_{12}H_{15}NS$ Isothiocyanic acid, pentamethylphenyl ester, 2314[1].
$C_{12}H_{15}N_3$ Crotononitrile, trimer, 1785[5], 3448[8].
$C_{12}H_{15}N_3O$ 1 - Indanone, 2 - ethyl-, semicarbazone, 1620[1].
$C_{12}H_{15}N_3OS$ Δ^2 - Cyclohexenone, 5 - furyl - 3-methyl-, thiosemicarbazone, 3161[8].
4 - Thiochromanone, 2,6 - dimethyl-, semicarbazone, 202[4].
$C_{12}H_{15}N_3O_2$ Cinnamaldehyde, α - ethoxy-, semicarbazone, 759[7].
Δ^2 - Cyclohexenone, 5 - furyl - 3 - methyl-, semicarbazone, 3161[2].
Cyclopentanecarboxamide, 1 - *N* - nitrosoanilino, 171[9].
Mesityl oxide, *p* - nitrophenylhydrazone, 761[7].
Δ^2 - Pyrazoline, 3,5,5 - trimethyl - 1 - (*p*-nitrophenyl)-, 761[7].
$C_{12}H_{15}N_3O_3$ Anthranilic acid, *N* - acetyl-, β-propionylhydrazide, 207[1].
—, *N* - propionyl-, β - acetylhydrazide, 206[9].
v - Benzenetriamine, *N*, *N'*, *N''* - triacetyl-, 2497[7].
Glutaramide, α - benzamido-, 1994[4].
$C_{12}H_{15}N_3O_3S$ Pyridine, 2,6 - diamino-, *p* - toluenesulfonate, 3009[5].
$C_{12}H_{15}N_3O_4$ Piperidine, dinitrotolyl-, 3448[4].
$C_{12}H_{15}N_3O_6$ 2,4,6 - *s* - Triazinetricarboxylic acid, tri-Et ester, 207[9].
$C_{12}H_{15}N_5$ Benzaldehyde, 5 - propyl - 3 - *s* - triazolylhydrazone, 3293[9].
$C_{12}H_{16}$ Acenaphthene, hexahydro-, 1405[1].
$C_{12}H_{16}BrNO_4$ 2,4 - Pyrroledicarboxylic acid, 5-(bromomethyl) - 3 - methyl-, di-Et ester, 2159[9], 2160[3].
$C_{12}H_{16}Br_2N_2O_4$ Rhamnose, (2,4 - dibromophenyl)hydrazone, 1794[4].
$C_{12}H_{16}Br_2N_2O_5$ Galactose, (2,4 - dibromophenyl)-hydrazone, 1794[3].
$C_{12}H_{16}Br_2O_7$ *d*-Glucose, triacetyldibromo-, 376[1].
$C_{12}H_{16}ClNO$ 2 - Pentanone, 4 - (*p* - chloroanilino)-4-methyl-, 2837[4].
$C_{12}H_{16}Cl_3IrN_2O$ Iridoaquodipicolinotrichloride, 2295[9], 3659[7].
$C_{12}H_{16}INOS$ (2 - Furylmethyl)dimethyl - 2-thienylmethylammonium iodide, 390[7].
$C_{12}H_{16}MoN_2O_6 + 2H_2O$ Ammonium dipyrocatecholatomolybdate, 3405[6].
$C_{12}H_{16}N_2$ α - Pentenaldehyde, α - methyl-, phenylhydrazone, 761[8].
Pyrrole, 2,2' - ethylenebis[4 - methyl-, 2159[6].
$C_{12}H_{16}N_2O$ Cyclohexanone, 2 - hydroxy-, phenylhydrazone, 2665[2].
Cyclopentanecarboxamide, 1 - anilino-, 171[8].
Cyclopentanone, 2 - hydroxy - 3 - methyl-, phenylhydrazone, 2485[1].
$C_{12}H_{16}N_2O_2$ Isovaleranilide, α - keto - β - methyl-, oxime, 360[3].
Piperidine, *m* - nitrobenzyl-, · *HI*, 3288[7].
$C_{12}H_{16}N_2O_3$ Glycine, *N* - (β - aminobutyryl)-*N*-phenyl-, 44[4].
Ornithine, *N*-benzoyl-, 2147[7], 2148[1].
$C_{12}H_{16}N_2O_5$ 2,4 - Pyrroledicarboxylic acid, 5-formyl - 3 - methyl-, di-Et ester, oxime, 2159[9].
$C_{12}H_{16}N_2O_5S$ Alanine, *N* - (*N* - tolylsulfonylglycyl)-, 3298[5].
Glycine, *N* - (*N* - tolylsulfonylalanyl)-, 3298[5].
$C_{12}H_{16}N_2O_6W + H_2O$ Ammonium dipyrocatecholatotungstate, 3405[8].
$C_{12}H_{16}N_2O_{13}$ *d*-Glucose, triacetyl-1,6-dinitrate, 742[9].
$C_{12}H_{16}N_4O_2S_2$ Compd. from 5 - (hydroxymethyl)-6 - methyl - 2 - (methylmercapto) - 4(1)-pyrimidone, 2682[1].
$C_{12}H_{16}N_4O_3$ Piperidine, (5 - nitro - *o* - anisylazo)-, 2840[6].
$C_{12}H_{16}N_4O_5S$ 1,2,3 - Triazole - 4 - carboxylic acid, 1 - benzylsulfonyl - 5 - hydroxy-, Et ester, NH_4 deriv., 1409[3].
—, 5 - hydroxy - 1 - *p* - tolylsulfonyl-, Et ester, NH_4 deriv., 1408[8].
$C_{12}H_{16}N_4O_6$ Theophylline, riboside, 1812[4]; xyloside, 1812[6].
$C_{12}H_{16}N_4O_9$ Glycine, Bu and isobutyl esters, picrate, 1055[2].
$C_{12}H_{16}N_4O_{18}$ Diamylose, tetranitrate, 381[1].
$C_{12}H_{16}N_6O_3$ Histidine, histidyl-, 2880[3].
Histidine anhydride, 2880[3].
$C_{12}H_{16}O$ Cyclohexanol, 2 - phenyl-, 1599[4].
2 - Hexenol, 2 - phenyl-, 1602[5].
Δ^4-2 Pentenol, 2-benzyl-, 1602[4].
$C_{12}H_{16}OS$ 4 - Thiochromanol, 4-ethyl-6-methyl, 203[6].
—, 4,6,8 - trimethyl-, 203[6].
$C_{12}H_{16}O_2$ Cumic acid, Et ester, 1793[5].
Cumic alcohol, acetate, 2488[2].
7 - *p* - Cymenecarboxylic acid, Me ester, 2488[4].
2 - Hexanone, 1 - hydroxy - 1 - phenyl-, 906[6].
Hydrocinnamic acid, β-propyl-, 1657[2].
2 - Pentanone, 1 - hydroxy - 4 - methyl-1-phenyl-, 906[6].
Phenetole, 2 - methoxy - 4 - propenyl, 402[4].
$C_{12}H_{16}O_3$ 2 - Butanone, 4 - (3,4 - dimethoxyphenyl)-, 739[7].
Caprophenone, 2,4 - dihydroxy-, 2320[5], 2995[7].
Durylaldehyde, 3,6 - dimethoxy-, 2320[8].
Isocaprophenone, 2,4 - dihydroxy-, 2320[3].
Ketone, 4 - methoxy - 6 - methyl - *m* - phenetyl methyl, 765[2].
$C_{12}H_{16}O_4$ Anisic acid, 5 - ethoxy - 2 - methyl, Me ester, 765[3].
Phlorocaprophenone, 1225[8].
1 - Propanol, 2,3 - dimethoxy-, benzoate, 376[7].
Propiophenone, 3,4,5 - trimethoxy-, 1610[4].
Quinone, 2,5 - dihydroxy - 3,6 - diisopropyl-, 2842[6].
$C_{12}H_{16}O_6$ 2 - Benzofuranpropionic acid, 2 - carboxyoctahydro - 1 - keto-, 1989[4].
$C_{12}H_{16}O_8$ 1,2,2,3 - Cyclobutanetetracarboxylic acid, tetra-Me ester, 48[9].
Glucosan, triacetate, 743[2].
Glucose anhydride, triacetate, 2829[7].
$C_{12}H_{16}O_{13}$ Digalacturonic acid, 3158[4].
$C_{12}H_{17}AsN_2O_7$ Carbamic acid, *N*, *N'* - (*p* - arsono - *o* - phenylene)bis-, di-Et ester, 1605[9].
$C_{12}H_{17}BrIN$ Benzyl - β - bromoallyldimethylammonium iodide, 390[2].

$C_{12}H_{17}BrN_2O_4$ Rhamnose, *p* - bromophenylhydrazone, 2987^{2}.

$C_{12}H_{17}BrN_2O_5$ Talose, *p* - bromophenylhydrazone, 904^{9}.

$C_{12}H_{17}BrO_2$ Dicyclopentadieneglycol, dihydro-, bromohydrin, acetate, 384^{6}.

$C_{12}H_{17}IN_2O_4$ Rhamnose, (iodophenyl)hydrazone, 1794^{9}, 1795^{1}.

$C_{12}H_{17}IN_2O_5$ Fructose, (iodophenyl)hydrazone, 1794^{9}, 1795^{1}.
Galactose, (iodophenyl)hydrazone, 1794^{9}, 1795^{1}.
d-Glucose, (iodophenyl)hydrazone, 1794^{9}.

$C_{12}H_{17}N$ Aniline, *N* - (cyclobutylmethyl) - *N*-methyl-, *and chloroplatinate*, 390^{5}.
Benzylamine, *N* - (cyclopropylmethyl)-*N*-methyl-, 390^{3}.
—, *N*, *N* - dimethyl - α - propenyl-, 1053^{5}.
Piperidine, 1-benzyl-, 1603^{5}.
Quinoline, 1,2,3,4 - tetrahydro - 2 - propyl-, 1626^{6}.

$C_{12}H_{17}NO$ Acetanilide, *p*-*sec*-butyl-, 1983^{9}
Butyramide, *N* - *p* - methylbenzyl-, 371^{2}.
α - Toluamide, *N*, *N* - diethyl-, 2997^{6}.

$C_{12}H_{17}NOS$ Acetanilide, *m* - (butylmercapto)-, 1063^{1}.
p-Valeraniside, thio-, 364^{1}.

$C_{12}H_{17}NO_2$ Benzoic acid, diethylaminomethyl ester, 2727^{3}.
—, *p*-amino-, Am ester, 2322^{7}.
Butyranilide, *p*-ethoxy-, 1218^{5}.
2 - Hexanone, 1 - hydroxy - 1 - phenyl-, oxime, 906^{6}.
2 - Pentanone, 1 - hydroxy - 4 methyl - 1-phenyl-, oxime, 906^{6}.

$C_{12}H_{17}NO_3$ Alanine, β - *p* - anisyl - *N* - methyl-, Me ester, 417^{6}.
Caprophenone, 2,4 - dihydroxy-, oxime, 2995^{8}.
Durylaldehyde, 3,6 - dimethoxy-, oxime, 2320^{8}.
Ketone, 4 - methoxy - 6 - methyl - *m* - phenetyl methyl, oxime, 765^{2}.
p - Toluic acid, 3 - amino - α - hydroxy-, Bu ester, 379^{1}.

$C_{12}H_{17}NO_3S$ Acetanilide, *m* - (butylsulfonyl)-, 1063^{1}.

$C_{12}H_{17}NO_4$ Spiro[Δ^{2} - bicyclopentene - 5,1′-cyclohexane], 1,3 - dimethoxy - 4 - nitro-, 3286^{6}.

$C_{12}H_{17}NO_5$ 2,4 - Pyrroledicarboxylic acid, 5-(hydroxymethyl) - 3 - methyl-, di-Et ester, 2160^{5}.
Veratric acid, 6 - (α - hydroxy - β - methylaminoethyl)-, 2331^{2,3}.

$C_{12}H_{17}NS$ *p*-Valerotoluide, thio-, 364^{1}.

$C_{12}H_{17}N_3O$ 3 - Pentanone, 1 - phenyl, semicarbazone, 2997^{5}.
Piperidine, (*o* - anisylazo)-, 2840^{5}.

$C_{12}H_{17}N_3O_2$ Acetophenone, 3 - ethyl - 2 - hydroxy - 5 - methyl-, semicarbazone, 2154^{6}.
—, hydroxytrimethyl-, semicarbazone, 2154^{7,8}.
—, methoxydimethyl-, semicarbazone, 2154^{4,5}.
2 - Butanone, 3 - *p* - anisyl-, semicarbazone, 2850^{7}.
—, 1 - hydroxy - 3 - methyl - 1 - phenyl-, semicarbazone, 906^{6}.
Isobutyrophenone, *p* - methoxy-, semicarbazone, 2850^{6}.
2 - Pentanone, 1 - hydroxy - 1 - phenyl-, semicarbazone, 906^{6}.
o - Tolualdehyde, 3,6 - dihydro - 5 - isopropyl - 6 - keto-, semicarbazone, 2846^{3}.

$C_{12}H_{17}N_3O_4$ *m* - Toluidine, *N* - isoamyl - 4,6-dinitro-, 173^{7}.

$C_{12}H_{17}N_3O_4S$ 2 - Propanone, 1 - (*p* - phenetylsulfonyl)-, semicarbazone, 419^{3}.

$C_{12}H_{17}O_2$ Caprokol, 2726^{8}.

$C_{12}H_{18}$ Benzene, hexamethyl-, 1984^{2}.
Cumene, *p*-propyl-, 2488^{9}.

$C_{12}H_{18}AsI$ Arsinoline, 1,2,3,4 - tetrahydro-1-methyl-, ethiodide, 2839^{6}.

$C_{12}H_{18}Be_4O_{13}$ Beryllium acetate (basic), 3597^{9}.

$C_{12}H_{18}BrN$ Homotetrahydroisoquinoline, methobromide, 905^{7}.

$C_{12}H_{18}BrNO_2$ (Carboxymethyl)trimethylammonium bromide, benzyl ester, 3688^{8}.

$C_{12}H_{18}ClN_3O$ Δ^{3} - *s* - Spirohendecen - 2 - one, 4-chloro-, semicarbazone, 1060^{6}.

$C_{12}H_{18}Cl_6N_4Pt$ 4 - Amino - 1 - methylpyridinium chloroplatinate, 1238^{4}.

$C_{12}H_{18}CuN_2O_2$ + H_2O, 2466^{1}.

$C_{12}H_{18}Hg$ 1 - Butine, 1,1′ - mercuribis[3,3,3′,3′-tetramethyl-, 1054^{1}.

$C_{12}H_{18}IN$ *sym* - Homotetrahydroisoquinoline, compd. with CH_3I, 1413^{8}.
1 - Indanyltrimethylammonium iodide, 755^{8}.

$C_{12}H_{18}MoN_2O_8$ Ammonium dipyrogallolmolybdate, 3405^{7}.

$C_{12}H_{18}N_2NiO_2$ 2466^{2}.

$C_{12}H_{18}N_2O$ Aniline, *N* - α,α - dimethyl - β-nitrosobutyl-, 1050^{6}.
2(1) - Pyridone, 1 - ethyl - 3 - (tetrahydro-1-methyl-2-pyrryl)-, 2863^{1}.

$C_{12}H_{18}N_2O_2$ Ethanol, diethylamino-, nicotinate, -*HCl*, 3168^{8}.
2 - Indazolecarboxylic acid, 4,5,6,7 - tetrahydro - 4,6 - dimethyl-, Et ester, 389^{7}.
Nitrosamine, m. 44–8°, of base from condensation product of PhNHOH and acetone, 2837^{8}.

$C_{12}H_{18}N_2O_3$ Barbituric acid, 5 - allyl - 5 - isoamyl-, 458^{8}.

$C_{12}H_{18}N_2O_4$ Barbituric acid, 5 - butyl - 5 - β-vinyloxyethyl-, 367^{9}.

$C_{12}H_{18}N_2O_8$ Arabinose, ureide, triacetate, 1596^{8}.

$C_{12}H_{18}N_2S$ Urea, (pentamethylphenyl)thio-, 2314^{1}.

$C_{12}H_{18}N_4O_4S_2$ 2,5 - Piperazinedione, 3,3′ - dithiodimethylenebis[6 - methyl-, 1787^{9}.

$C_{12}H_{18}N_4O_{11}$ Triethylamine, β,β′β″ - trihydroxy-*N* - oxide, picrate, 361^{2}.

$C_{12}H_{18}OS$ Ether, γ - (benzylmercapto)propyl ethyl, 737^{2}.

$C_{12}H_{18}O_2$ Acetophenone, di-Et acetal, 764^{4}.
Benzyl alcohol, *o* - (γ - ethoxypropyl)-, 905^{5}.
1,3 - Cyclohexanedione, 5 - cyclohexyl-, 3287^{7}.
Resorcinol, dipropyl-, 3163^{7}.
—, hexyl-, 451^{9}, 2320^{9}, 2369^{6,7}, 2371^{2}, 2995^{9}, 3780^{4}.
—, 4-isohexyl-, 2320^{9}.

$C_{12}H_{18}O_3$ Benzene, 1,2,3 - trimethoxy - 5-propyl-, 1610^{8}.
Benzyl alcohol, 2,5 - dimethoxy - 3,4,6-trimethyl-, acetate, 2320^{8}.
2 - Butanol, 4 - (3,4 - dimethoxyphenyl)-, 739^{1}.
Camphor, hydroxy-, acetate, 2157^{9}.
Compd., b. 167–8°, from acrolein, 1594^{2}.
Phloroglucinol, 2 - hexyl-, 1225^{8}.
—, triethyl-, 3163^{7}.
Pyromucic acid, heptyl ester, 1620^{8}.

$C_{12}H_{18}O_3S$ Ether, γ - (benzylsulfonyl)propyl ethyl, 737[2].

$C_{12}H_{18}O_4$ 2 - Bicyclo[2.2.2]octanecarboxylic acid, 3,5 - diketo - 1 - methyl-, Et ester, 172[7].

Cyclopentenemalonic acid, diethyl ester, 3160[9].

2,7-Octanedione, 3-acetyl-6-α-hydroxyethylidene , 1055[9].

—, 3,6 - bis(α - hydroxyethylidene-, 1056[1].

—, 3,6-diacetyl-, 1055[9].

$C_{12}H_{18}O_5$ Cyclohexaneacetic acid, 4 - carboxy - 3 - keto - 1 - methyl-, mono-Et ester, 172[7].

4 - Pyranbutyric acid, tetrahydro - 2,6-diketo - 4 - methyl-, Et ester, 172[8].

$C_{12}H_{18}O_6$ Mannonic acid, diacetone-, lactone, 2984[4].

Δ[8] - 1,1,5 - Pentenetricarboxylic acid, 2-methyl-, tri-Me ester, 1592[3].

Succinic acid, diacetyl-, di-Et ester, 1788[8].

$C_{12}H_{18}O_7$ Acid, from the oxidation of β-diacetone-fructose, *K salt*, 1388[5].

Galacturonic acid, diacetone-, *and K salt*, 1389[3].

$C_{12}H_{18}O_7S$ Triacetate of thiosugar from yeast, 583[4].

$C_{12}H_{18}O_8$ Compd., m. 206–7°, from glyoxal sulfate and Me_2CO, 2821[6].

$C_{12}H_{19}As$ Arsine, dimethyl(δ - phenylbutyl)-, 2839[6].

$C_{12}H_{19}ClO_5$ *d* - Glucose, 3 - chlorodiacetone-, 1060[4].

$C_{12}H_{19}IN_2$ 1 - Ethyl - 3 - (tetrahydro - 1 - methyl-2 - pyrryl)pyridinium iodide, *-HI*, 2863[1].

$C_{12}H_{19}IN_2S$ Pseudourea, α - ethyl - β,γ - dimethyl - α - phenylthio-, methiodide, 374[4].

$C_{12}H_{19}N$ Benzylamine, α - ethyl - *N*, *N*,α - trimethyl-, 1053[3].

1 - Hendecine - 1 - nitrile, 1783[8].

Pyridine, 3,5 - diisopropyl - 2 - methyl-, 2499[4].

$C_{12}H_{19}NO$ Base, b_{16} 160–3°, from condensation product of PhNHOH and acetone, *and chloroplatinate*, 2837[7,8].

Benzylamine, *o* - (γ - ethoxypropyl)-, *and -HCl*, 905[4].

Camphidone, 4 - ethylidene-, 2999[3].

Propylamine, γ - methoxy - *N*, *N* - dimethyl-γ-phenyl-, *-HCl*, 1604[9].

$C_{12}H_{19}NO_2$ Aniline, *N*, *N* - diethyl-, acetate, 588[7].

$C_{12}H_{19}NO_2S$ 2 - Thiophenecarboxylic acid, α-(dimethylaminomethyl) - *sec* - butyl ester, *and salts*, 2854[7].

$C_{12}H_{19}NO_3S$ Cyclohexanesulfonic acid, aniline salt, 3163[1].

$C_{12}H_{20}BrFe_3O_{14}$ + $5H_2O$, 2127[8].

$C_{12}H_{20}Br_2O_4$ Suberic acid, α,ζ - dibromo-, di Et ester, 2830[9].

$C_{12}H_{20}ClFe_3O_{14}$ + $4H_2O$, 2127[8].

$C_{12}H_{20}Cl_3Fe_3NaO_{22}$ + $4H_2O$, 1769[5].

$C_{12}H_{20}MoN_2O_{10}$ + nH_2O, 3656[7].

$C_{12}H_{20}N_2$ Cyclohexanenitrile, 1-piperidyl-, 2831[9].

α-Matrinidine, 2854[2].

Pyridine, 1,2 - dihydro - 1,2 - dimethyl-3 (or 5) - (tetrahydro - 1 - methyl - 2-pyrryl)-, 2863[2].

$C_{12}H_{20}N_2O$ Isofenchone, acetylhydrazone, 2846[7].

$C_{12}H_{20}N_2O_2$ Phenoxazine, dodecahydro - 6-nitroso-, 2831[9].

$C_{12}H_{20}N_2O_4$ Propionic acid, α,α′ - [(cyanomethyl)imino]bis-, di-Et ester, *and -HCl*, 3283[5].

$C_{12}H_{20}N_2O_5$ Barbituric acid, 5,5 - bis(propoxymethyl)-, 581[9].

—, 5,5-dibutyl-, 458[7].

$C_{12}H_{20}N_2O_{10}W$ + nH_2O, 3656[7].

$C_{12}H_{20}N_4O_3S$ Thiasine, 1814[4].

$C_{12}H_{20}N_4O_4$ 4 - Imidazolecarboxamide, 4 - ethoxy-*N* - ethyltetrahydro - 2 - keto - 3 - methyl-5-methylimino-, Ac deriv., 3691[8].

$C_{12}H_{20}N_4O_6$ Tetrapeptide from dialanylcystine dianhydride, *-HCl*, 1788[1].

$C_{12}H_{20}O$ Compd., b_3 101–4°, from iso-BuMeCO and mesityl oxide, 3157[5].

Compd., b_{11} 119–21°, from MeBuCO and mesityl oxide, 3157[5].

$C_{12}H_{20}O_2$ Δ^2 - 1 - Propenone, 3 - hydroxy - 1-(1,2,2,3-tetramethylcyclopentyl)-, 1399[4].

$C_{12}H_{20}O_3$ Cyclohexaneacetic acid, 1-acetyl-, Et ester, 3693[4].

Menthone, - (hydroxymethyl)-, formate, 2846[2].

$C_{12}H_{20}O_4$ 1,1 - Cyclohexanedicarboxylic acid, di-Et ester, 1056[2].

$C_{12}H_{20}O_6$ Fructose, diacetone-, 1388[2].

Galactose, diacetone-, 1389[1], 1597[2].

d-Glucose, diacetone-, 2314[4], 2987[9].

Mannose, diacetone-, 2663[5], 2827[6], 2984[4].

Propionin, 2483[8].

$C_{12}H_{20}O_7$ Mannonic acid, diacetone-, *K salt*, 2984[4].

$C_{12}H_{20}O_{10}$ (See also *Inulin.*)

Cellobiose anhydride, 381[2].

Diglucosan, 2829[5].

Dihexosan, 1598[3].

$C_{12}H_{20}O_{12}$ 1,1,3,3 - Propenetetracarboxylic acid, 2 - (dicarboxymethyl)-, hexa-Me ester, 2861[2].

$C_{12}H_{21}BrO$ 1 - Propanone, 3 bromo - 1 - (1,2,2,3-tetramethylcyclopentyl)-, 1399[7].

$C_{12}H_{21}FO_{10}$ Gentiobiosyl fluoride, 1221[8].

$C_{12}H_{21}NO$ Camphoceanonitrile, 3 - (α - hydroxypropyl)-, 2999[4].

1 - Hendecine - 1 - carboxamide, 1783[8].

Phenoxazine, dodecahydro-, *-HCl*, 2831[8].

$C_{12}H_{21}NO_2$ Fuchsisenecionine, 2046[4].

Nipecotic acid, 1 - butyl - 4 - keto-, Et ester, *-HCl*, 3010[2].

—, 1 - isobutyl - 4 - keto-, Et ester, *-HCl*, 3010[2].

$C_{12}H_{21}NO_4$ Silvasenecine, 2046[4].

$C_{12}H_{21}NO_5$ Glucosyl - 3 - amine, diacetone-, 2662[5].

$C_{12}H_{21}NO_6$ Triethylamine, β,β′,β″ - trihydroxy-, triacetate, *chloroplatinate*, 361[2].

$C_{12}H_{21}N_3O$ Semicarbazone, m. 170°, of condensation product of Et_2CO and mesityl oxide, 3157[5].

Semicarbazone, m. 172°, of condensation product of MePrCO and mesityl oxide, 3157[6].

2 - *s* - Spirohendecanone, semicarbazone, 1060[8].

$C_{12}H_{21}N_3O_2$ Cyclohexanone, 2 - (methoxymethylene) - 3,5 - dimethyl-, 2 - methylsemicarbazone, 389[8].

Cyclopentaneglyoxal, 1,2,2,3 - tetramethyl-, semicarbazone, 1399[3].

Menthone, 2 - (hydroxymethylene)-, semicarbazone, 2846[1].

$C_{12}H_{21}N_3O_3$ Cyclohexaneacetic acid, 1-acetonyl-, semicarbazone, 1060[7].

—, 3 - keto - 1 - methyl-, Et ester, semicarbazone, 172[8].
$C_{12}H_{21}N_3S$ Δ[2] - Cyclohexenone, 5 - isobutyl - 3-methyl-, thiosemicarbazone, 3161[8].
$C_{12}H_{22}$ Bicyclohexyl, 744[6].
Cyclohexane, (3 - methylcyclopentyl), 1393[1].
Hydrocarbon, b_{18} 83–8°, from PrMgBr and 1,3 - dibromopropene, 3155[5].
Naphthalene, decahydrodimethyl-, 2935[7].
$C_{12}H_{22}Cl_2N_4O_6$ Tetrapeptide, *and -HCl*, 2682[8].
$C_{12}H_{22}Cl_2O_2Te$ Bis(β - keto - γ,γ - dimethylbutyl)tellurium dichloride, 413[9].
Bis(β - ketohexyl)tellurium dichloride, 413[9].
Bis(β - ketoisohexyl)tellurium dichloride, 413[9].
$C_{12}H_{22}CoN_2O_4$, 716[5].
$C_{12}H_{22}N_2O$ Cyclohexanecarboxamide, 1-piperidyl-, 2831[9].
$C_{12}H_{22}N_2O_2$ 2(1) - Pyrazinone, 3,4 - dihydro-5 - hydroxy - 3,6 - diisobutyl-, 1629[2].
$C_{12}H_{22}N_4O_4$ 2,7 - Octanedione, 3,6 - diacetyl-, tetraoxime, 1056[1].
$C_{12}H_{22}O$ Cyclododecanone, 1792[6], 2151[6].
Cyclohexyl ether, 744[5].
$C_{12}H_{22}O_2$ Cyclohexanecaproic acid, 3160[4].
Cyclopentanecarbinol, 1,2,2,3 - tetramethyl-, acetate, 1399[2].
2,4-Dodecanedione, 738[9].
Dodecenoic acid, 2420[4].
3,5-Heptanedione, 4-β-methylbutyl-, 413[7].
Δ[6] - 3 - Octenol, 3,7 - dimethyl-, acetate, 3687[1].
1 - Propanone, 3 - hydroxy - 1 - (1,2,2,3-tetramethylcyclopentyl)-, 1399[5].
ι - Undecylenic acid, Me ester, 1590[7].
$C_{12}H_{22}O_3$ Glycolic acid, menthyl ester, 43[6].
$C_{12}H_{22}O_4$ Adipic acid, di-Pr ester, 3689[7].
Decanedicarboxylic acid, 1789[2], 2937[5].
Succinic acid, di-Bu ester, 3689[6].
$C_{12}H_{22}O_5$ Malonic acid, (ethoxymethyl)ethyl-, di-Et ester, 581[6]
$C_{12}H_{22}O_6$ Acetoacetic acid, γ,γ - diethoxy - α-(methoxymethyl)-, Et ester, 388[7].
d-Glucose, 3,5,6 - trimethylmonoacetone-, 580[9].
$C_{12}H_{22}O_{11}$ (See also *Lactose; Maltose, Sucrose; Trehalose*)
Cellobiose, 380[3], 2484[2], 2988[2].
Celtrobiose, 2484[7].
Gentiobiose, 1221[6,9], 1597[9], 2828[8], 3833[2].
Isomaltose, 1221[9], 1597[9], 2829[3], 3159[7].
Neolactose, 2483[9], 3159[6].
$C_{12}H_{22}O_{12}$ Neolactobionic acid, 3159[6]
$C_{12}H_{22}O_{12}S$ Sulfone, 1,1-digalactosyl, 379[7]
—, 1,1-diglucosyl, 379[8].
$C_{12}H_{23}Br$ Cyclohexane, bromohexyl-, 3160[1].
$C_{12}H_{23}CuNO_2$ 6 - Dodecanone, 7 - hydroxy, oxime, Cu deriv., 1055[8].
$C_{12}H_{23}NO$ Ketone, methylaminomethyl 1,2,2,3-tetramethylcyclopentyl, 1399[4].
$C_{12}H_{23}NOS$ Carbamic acid, methylthiono-, *l*-menthyl ester, 373[8].
$C_{12}H_{23}NO_2$ Undecylenamide, *N* - (hydroxymethyl)-, 405[1].
$C_{12}H_{23}NO_4$ Propionic acid, β,β' - (ethylimino)-bis-, di-Et ester, 3010[1].
$C_{12}H_{23}N_3O$ Cyclohendecanone, semicarbazone, 1792[4].
$C_{12}H_{23}N_3O_3$ Enanthic acid, γ - keto - α,ε - dimethyl-, Et ester, semicarbazone, 407[6].
Pelargonic acid, θ-formyl-, Me ester, semicarbazone, 1590[2].
$C_{12}H_{24}BrCoN_2O_2 + 2H_2O$, 716[6].
$C_{12}H_{24}BrN_3O$ 2 - Hendecanone, 1 - bromo-, semicarbazone, 1783[6].
$C_{12}H_{24}Br_2$ Dodecane, 1,12 - dibromo-, 1789[2].
$C_{12}H_{24}Br_2O$ Compds. from tetrahydro - 2,6-dimethyl-4-pyranol, 1624[4,5].
$C_{12}H_{24}ClCoN_2O_2 + 2H_2O$, 716[9].
$C_{12}H_{24}ClCoN_2O_5 + 2H_2O$, 716[6].
$C_{12}H_{24}ClCoN_2O_6$, 716[6].
$C_{12}H_{24}ClN_3O$ 2 - Hendecanone, 1 - chloro-, semicarbazone, 1783[7].
$C_{12}H_{24}CoCrN_6O_{12}$, 1344[8].
$C_{12}H_{24}CoIN_2O_2 + 2H_2O$, 716[6].
$C_{12}H_{24}CoN_3O_4 + 2H_2O$, 716[6].
$C_{12}H_{24}CoN_3O_6 + 2H_2O$, 716[6].
$C_{12}H_{24}Co_2Mo_6N_6O_{17}$, 1185[2].
$C_{12}H_{24}Co_2N_6O_{12}$, 1344[8].
$C_{12}H_{24}Co_2Mo_6N_6O_9 + 12H_2O$, 1185[2].
$C_{12}H_{24}Mo_6N_6Ni_3O_{21} + 16H_2O$, 1185[4].
$C_{12}H_{24}Mo_9N_6Ni_3O_{27} + 36H_2O$, 1185[3].
$C_{12}H_{24}N_4O_3$ 2 - Butanone, 4,4',4'' - nitrilotris-, trioxime, *and -HCl*, 1808[7].
$C_{12}H_{24}N_6O_2$ Δ[3] - 2 - Butenone, 4 - cylohexyl-, semicarbazide - semicarbazone, 3287[1].
$C_{12}H_{24}O$ Cyclohexanehexanol, 3159[9].
Δ[6] - 5 - Decenol, 5,9 - dimethyl-, 3687[1].
Lauraldehyde, 2310[2].
$C_{12}H_{24}O_2$ (See also *Lauric acid*).
Caprylic acid, α-ethyl-, Et ester, 363[1]
5-Dodecanone, 6-hydroxy-, 1786[7].
$C_{12}H_{25}Br$ Dodecane, 1-bromo-, 39[4].
$C_{12}H_{25}NO_4$ Diamylamine, oxalate, 1216[8].
$C_{12}H_{25}N_3O_2$ 4 - Hendecanone, 5 - hydroxy-, semicarbazone, 1786[7].
$C_{12}H_{26}INO$ Cyclohexaneëthanol, β - dimethylamino - 3 - methyl, methiodide, 904[1]
$C_{12}H_{26}O_2$ 3,4 - Decanediol, 3-ethyl-, 1786[5]
1,12 Dodecanediol, 1789[1].
4,5 - Hendecanediol, 4 methyl-, 1786[7]
4,5 - Octanediol, 2 - methyl 5 - propyl, 1786[4].
$C_{12}H_{26}O_2S_2$ 2 - Butanone, bis(β - ethoxyethyl) mercaptole, 737[4].
$C_{12}H_{27}N$ Butylamine, *N,N*,α,α - tetraethyl, *and salts*, 3280[4].
Tributylamine, 3688[6].
$C_{12}H_{27}NO_2$ Butyraldehyde, β - diethylamino, di-Et acetal, 1788[8].
$C_{12}H_{27}N_3$ Piperidine, 1 - [β - {(ε - aminoamyl)-amino}ethyl}, *and salts*, 2862[7].
$C_{12}H_{28}N_2OS$ Triethylamine, β,β''' - sulfinylbis-, *di-HCl*, 40[2].
$C_{12}H_{28}N_2O_2S$ Triethylamine, β,β''' - sulfonylbis, *di-HCl*, 40[3].
$C_{12}H_{28}N_2O_4$ Propylamine, α - ethyl, oxalate, 900[1].
$C_{12}H_{28}N_2O_6$ 2 - Butanol, 1 - hydroxamino - 3-methyl-, oxalate, 1052[3]
2 - Pentanol, 1 - hydroxamino, oxalate, 1052[3].
$C_{12}H_{28}N_2S$ Triethylamine, β,β''' - thiobis-, *and di-HCl*, 40[2].
$C_{12}H_{29}NO$ Dibutyldiethylammonium hydroxide, 3747[6].
Tetrapropylammonium hydroxide, 3747[6].
$C_{12}H_{30}Br_2CaO_2$, 1746[1].
$C_{12}H_{30}CaCl_2O_2$, 1746[3].
$C_{12}H_{30}Sn_2$ Distannane, hexaethyl-, 2977[6].
$C_{12}H_{40}Cl_2FeN_4$, 25[9].
$C_{12}H_{44}Cl_6Co_2N_{12}Ni$, 1344[8].
$C_{13}H_6Br_2N_2O_6$ Phenol, 3,5 - dibromo - 2,4-dinitro-, benzoate, 1609[8].
$C_{13}H_6Br_3ClO_2$ Phenol, 2,3,6 - tribromo - 4-chloro-, benzoate, 1610[1].

$C_{13}H_6Cl_3N_3O_2$ Toluene, trichloro - α - (o - nitrophenylisodiazo)-, 175[4].
$C_{13}H_7AlO_6 + 2H_2O$ Maclurin, Al deriv., 406[1].
$C_{13}H_7BrCl_3N_3O_2$ Benzoyl bromide, o - nitro-, trichlorophenylhydrazone, 175[3,4].
$C_{13}H_7BrN_2O_5$ Benzophenone, 2 - bromo - 3,5-dinitro-, 1229[8].
$C_{13}H_7BrOS$ 4,1 - β - Naphthothiopyrone, 2-bromo-, 202[7].
$C_{13}H_7Br_2N_3O_2$ Toluene, 2,4 - dibromo - α-(o - nitrophenylisodiazo)-, 175[3].
$C_{13}H_7Br_2N_5O_2$ 1,2,3,5 - Tetrazole, 1 - (2,4 dibromophenyl) - 4 - (m - nitrophenyl)-, 1085[3].
$C_{13}H_7Cl_2N_3O_2$ Benzazimidole, 5,6 - dichloro-, benzoate, 750[7].
Toluene, 2,4 - dichloro - α - (o - nitrophenylisodiazo)-, 175[3].
$C_{13}H_7Cl_4N_3O_2$ Benzoyl chloride, o - nitro-, 2,4,6 - trichlorophenylhydrazone, 175[4]
$C_{13}H_7FeO_4$ Benzophenone, trihydroxy-, Fe deriv., 405[9]
$C_{13}H_7FeO_6 + 2H_2O$ Maclurin, Fe deriv, 405[9].
$C_{13}H_7KN_2O_6$ Benzophenone, 2 - hydroxy - 3,5-dinitro-, K deriv., 1229[8].
$C_{13}H_7N_3O_4S$ Benzothiazole, dinitro - 1 - phenyl (?), 1236[8].
—, nitro(nitrophenyl)-, 1236[8].
$C_{13}H_7N_3O_5$ Benzisoxazole, 4,6 - dinitro - 2-phenyl-, 1229[8].
$C_{13}H_8BrClO_2$ Phenol, 3 - bromo - 5 - chloro, benzoate, 3449[1].
$C_{13}H_8BrCl_2N_3O_2$ Benzoyl bromide, o - nitro-, 2,4 - dichlorophenylhydrazone, 175[3]
$C_{13}H_8BrIO_2$ Phenol, 3 bromo - 5 - iodo-, benzoate, 3449[7].
$C_{13}H_8BrNO_3$ Benzophenone, 2 - bromo - 5 nitro, 1230[1].
$C_{13}H_8BrNO_4$ Phenol, 3 - bromo - 2 - nitro-, benzoate, 1064[1]
$C_{13}H_8BrN_3O_2$ Toluene, p - bromo - α - (o - nitrophenylisodiazo)-, 175[3]
$C_{13}H_8Br_2N_2O_2$ Carbazole, 3,6 - dibromo - 9 - methyl-1 nitro-, 1079[6].
$C_{13}H_8Br_2N_2O_2S$ Benzothiazole, 5 - nitro - 1-phenyl, dibromide, 1806[8].
$C_{13}H_8Br_2N_4$ 1,2,3,5 - Tetrazole, 1 - (2,4 - dibromophenyl) - 4 - phenyl-, 1085[3].
$C_{13}H_8Br_2OS$ 4,1 - β - Naphthothiopyrone, 2,2 dibromo - 2,3 dihydro, 202[8].
$C_{13}H_8Br_2O_2$ Phenol, 3,5 - dibromo-, benzoate, 3449[1].
$C_{13}H_8Br_3N_3O_2$ Benzoyl bromide, o nitro-, 2,4-dibromophenylhydrazone, 175[3].
$C_{13}H_8Br_5NS$ Benzothiazole, 5 - bromo - 1 - phenyl, tetrabromide, 1806[8].
$C_{13}H_8ClIO_2$ Phenol, 3 - chloro - 5 - iodo-, benzoate, 3449[1].
$C_{13}H_8ClNO_4$ Phenol, 3 - chloro - 5 - nitro-, benzoate, 3448[9].
$C_{13}H_8ClNS$ Benzothiazole, 5 - chloro - 1-phenyl-, 1236[7].
$C_{13}H_8ClN_3O_2$ Benzazimidole, 5 - chloro, benzoate, 750[3].
Toluene, p-chloro-α (o-nitrophenylisodiazo)-, 175[4].
$C_{13}H_8ClN_3O_5$ Benzanilide, 2 - chloro - 3,5 - dinitro-, 181[8].
$C_{13}H_8Cl_2O$ Benzophenone, 3,4 - dichloro-, 2152[4].
$C_{13}H_8Cl_2O_2$ Phenol, 3,5 - dichloro-, benzoate, 3449[1].
$C_{13}H_8Cl_3N_3O_2$ Benzoyl chloride, o - nitro-, 2,4-dichlorophenylhydrazone, 175[4].
$C_{13}H_8Cl_3N_3O_3$ Benzaldehyde, 2,4,6 - trichloro-3-hydroxy-, p-nitrophenylhydrazone, 1065[5].
$C_{13}H_8INO_4$ Phenol, 3 - iodo - 5 - nitro-, benzoate, 3449[1].
$C_{13}H_8I_2O_2$ Phenol, 3,5 - diiodo-, benzoate, 3449[1].
$C_{13}H_8N_2O_2S$ Benzothiazole, nitrophenyl-, 1236[8].
$C_{13}H_8N_2O_3$ Benzisoxazole, 4 - nitro - 2 - phenyl-, 1229[9].
$C_{13}H_8N_2O_3S$ Benzothiazole, 1 - (4 - hydroxy-? - nitrophenyl)-(?), 1236[9].
—, 1 - (p - hydroxyphenyl)nitro-(?), 1236[9]
$C_{13}H_8N_2O_7$ Chelidonanilic acid, 3′-nitro-, 586[6].
$C_{13}H_8N_4S$ Acenaphthenequinone, cyclic thiocarbohydrazone, 1810[7].
$C_{13}H_8O + H_2O$ Fluorenone hydrate, 1073[6].
$C_{13}H_8OS$ Xanthone, 9-thio-, 2977[1]; *$HgCl_2$ addn. compd.*, 365[2].
$C_{13}H_8OTe$ Telluroxanthone, 2315[9].
$C_{13}H_8O_2$ Xanthone, 2680[1].
$C_{13}H_8O_2S$ 2 - β - Naphthothiophenealdehyde, 3-hydroxy-, 203[1].
$C_{13}H_9AsClN_3O_8$ Arsanilic acid, N - (4 - chloro-3 - nitrobenzoyl) - 3 - nitro-, 394[7].
$C_{13}H_9AsCl_5N$ Phenarsazine, 1 - chloro - 1,6-dihydro, CCl_4 addn. compd., 1606[8].
$C_{13}H_9AsN_2O_5S$ 1 - Benzothiazole - p - benzenearsonic acid, nitro-, 1080[3].
$C_{13}H_9BrN_2O_3$ Benzophenone, 2 - bromo - 5-nitro-, oxime, 1230[1].
$C_{13}H_9BrO_2$ Benzoic acid, bromophenyl-, 1988[1,2].
2(1) - α - Naphthofuranone, 4 - bromo - 1-methyl-, 1617[4].
$C_{13}H_9BrO_4$ 2 - Naphthoic acid, 4 - bromo - 3-hydroxy-, acetate, 910[1].
$C_{13}H_9BrS_2$ 1,3 - Benzodisulfole, 5 - bromo - 2-phenyl-, 1797[8].
$C_{13}H_9Br_2N$ Carbazole, 3,6 - dibromo - 9 - methyl-, 1079[6].
$C_{13}H_9Br_2N_3O_2$ Benzoyl bromide, o - nitro-, p bromophenylhydrazone, 175[3]
$C_{13}H_9Br_2N_5$ Pentazine, 2 - (2,4 - dibromophenyl) - 2,5 - dihydro - 6 - phenyl, 1085[1].
$C_{13}H_9Br_3S_2$ 2 - Phenyl - 1,3 - benzdithiole - 1-sulfonium perbromide, 3290[2].
$C_{13}H_9Br_4NS$ Benzothiazole, 1 - phenyl-, tetrabromide, 1806[8].
$C_{13}H_9ClHgN_2O_3$ Benzoic acid, m (o and p)-(3 - chloromercuri - 4 - hydroxyphenylazo)-, 1605[5].
$C_{13}H_9ClN_2O_3$ Benzanilide, 2 - chloro - 5 - nitro, 1229[9].
Benzophenone, 2 - chloro - 5 - nitro-, oxime, 1229[9].
$C_{13}H_9ClN_4O_4$ Benzaldehyde, 5 - chloro - 2,4-dinitrophenylhydrazone, 750[5].
$C_{13}H_9ClN_4O_5$ Hydrazine, α - benzoyl - β - (5-chloro - 2,4 - dinitrophenyl)-, 750[5].
$C_{13}H_9ClO_2$ Benzophenone, 5 - chloro - 2 - hydroxy-, 1238[2].
$C_{13}H_9ClO_3$ 1 - Naphthoyl chloride, hydroxy-, acetate, 1226[5], 1233[4]
$C_{13}H_9ClS_2$ 2 - Phenyl - 1,3 - benzdithiole - 1-sulfonium chloride, *and salts*, 3290[2].
$C_{13}H_9Cl_2NO_2$ Anthranilic acid, N - (2,5 - dichlorophenyl)-, 1992[4].
$C_{13}H_9Cl_2N_3O_2$ Benzaldehyde, dichloronitrophenylhydrazone, 750[6,8].
$C_{13}H_9Cl_2N_3O_3$ Benzaldehyde, 2,4 (and 2,6)-dichloro - 3 - hydroxy-, p - nitrophenylhydrazone, 1065[4].

Salicylaldehyde, 4,5 - dichloro - 2 - nitrophenylhydrazone, 750^{6}.
$C_{13}H_9Cl_2N_3O_4$ Resorcylaldehyde, 4,5-dichloro-2-nitrophenylhydrazone, 750^{6}.
$C_{13}H_9I_2N$ Carbazole, 3,6 - diiodo - 9 - methyl-, 1805^{9}.
$C_{13}H_9NOS$ 2(1) - Benzisothiazolone, 1-phenyl-, 2327^{7}.
Benzothiazole, 1 - (*p* - hydroxyphenyl)-, 1236^{8}.
5 - Benzothiazolol, 1 - phenyl-, 1236^{9}.
$C_{13}H_9NO_2$ 1,2-*β*-Naphthazoledione, 3 - methyl -, 2681^{7}.
2 - Naphthonitrile, 3 - hydroxy-, acetate, 910^{5}.
$C_{13}H_9NO_2S_2$ 1,3 - Benzodisulfole, 2 - (*o* - nitrophenyl)-, 1797^{7}.
$C_{13}H_9NO_3$ 2 - Furanglycolonitrile, benzoate, 1615^{6}.
$C_{13}H_9N_3O_2$ 6,7 - Isoindazoledione, 4 - anilino-, 1623^{2}.
$C_{13}H_{10}$ Fluorene, 410^{6}, 2455^{6}.
Naphthalene, 1 - propargyl-, 2676^{9}.
$C_{13}H_{10}AsClN_2O_6$ Arsanilic acid, *N* - (4 - chloro-3-nitrobenzoyl)-, 394^{7}.
$C_{13}H_{10}AsNO_3S$ 5 - Benzothiazolearsonic acid, 1-phenyl-, 1080^{2}.
1 - Benzothiazole - *p* - benzenearsonic acid, 1080^{2}.
$C_{13}H_{10}AsNO_4S$ Benzothiazolearsonic acid, 1-(*p* - hydroxyphenyl)-, 1080^{3}.
$C_{13}H_{10}AsN_3O_8$ Arsanilic acid, *N* - 3,5 - dinitrobenzoyl-, 394^{1}.
—, 3 - nitro - *N* - 3 - nitrobenzoyl-, *and salts*, 393^{9}.
$C_{13}H_{10}AsN_3O_9$ Arsanilic acid, 2 - hydroxy - 5-nitro - *N* - (3 - nitrobenzoyl)-, 2318^{4}.
$C_{13}H_{10}BrNO_3$ 2 - Naphthamide, *N* - acetyl-4 - bromo - 3 - hydroxy-, 910^{4}.
—, 4 - bromo - 3 - hydroxy-, acetate, 910^{4}.
$C_{13}H_{10}BrN_2O_6P$ Compd., m. 135–9°, from 2-bromo - 5 - nitrobenzophenone oxime, 1230^{1}.
$C_{13}H_{10}BrN_3O_2$ Benzaldehyde, bromo-, *p* - nitrophenylhydrazone, 1986^{4}, 2321^{5}, 2672^{3}.
—, 4 - bromo - 3 - nitro-, phenylhydrazone, 2321^{7}.
$C_{13}H_{10}BrN_3O_4$ *o* - Cresol, 4 - bromo - 6 - nitro-*α* - *N* - nitrosoanilino-, 1610^{3}.
$C_{13}H_{10}Br_2O_2$ 2 - Propionaphthone, *α*,4 - dibromo-1-hydroxy-, 1617^{3}.
$C_{13}H_{10}Br_4N_2S$ Benzothiazole, 5 - amino - 1-phenyl-, tetrabromide, 1806^{9}.
—, 1 - anilino-, tetrabromide, 194^{9}.
$C_{13}H_{10}ClNO_3$ Ether, benzyl 4 - chloro - 2 - nitrophenyl, 2319^{7}.
$C_{13}H_{10}ClNO_4$ Propionyl chloride, *α*-(nitromethoxy)-, $1618^{1,2}$.
$C_{13}H_{10}ClN_2O_6P$ + H_2O Compd., m. 136–8°, from 2 - chloro - 5 - nitrobenzophenone oxime, 1230^{1}.
$C_{13}H_{10}ClN_3O_2$ Benzaldehyde, chloro-, *p*-nitrophenylhydrazone, 1986^{4}, 2321^{5}.
—, 4 - chloro - 3 - nitro-, phenylhydrazone, 2321^{6}.
$C_{13}H_{10}ClN_3O_3$ Benzaldehyde, chlorohydroxy-, *p* - nitrophenylhydrazone, $1065^{3,4}$.
$C_{13}H_{10}Cl_2O$ Ether, benzyl 2,4 - dichlorophenyl, 3695^{9}.
$C_{13}H_{10}HgN_2O_4S$ Benzenesulfonic acid, *p*-(3 - hydroxymercuri - 2,5 - cresylazo)-, anhydride, *Na salt*, 1605^{9}.
$C_{13}H_{10}IN_3O_2$ Benzaldehyde, *m* - iodo-, *p* - nitrophenylhydrazone, 1986^{4}.
$C_{13}H_{10}NNaO_3$ Phenol, *o* - nitro-, **Na deriv.**, salicylaldehyde addn. compd., 741^{4}.
$C_{13}H_{10}N_2$ Benzimidazole, 1 - phenyl-, *and* - *HCl*, 745^{9}.
1,4 - Imidazopyridine, 2 - phenyl-, *and salts*, 3009^{9}.
Indazole, 2-phenyl-, 2496^{2}.
$C_{13}H_{10}N_2O$ Indazole, 2-phenyl-, 1-oxide, 1806^{1}.
$C_{13}H_{10}N_2OS$ Benzothiazole, aminohydroxyphenyl-, 1236^{9}.
$C_{13}H_{10}N_2O_2$ Aniline, *N* - *o* - nitrobenzal-, 1216^{2}.
Benzaldehyde, *m* (and *p*) - (*p* - hydroxyphenylazo)-, $2836^{4,6}$.
$C_{13}H_{10}N_2O_3$ Benzaldehyde, *p* - (2,4 - dihydroxyphenylazo)-, 2836^{5}.
Salicylaldehyde, 4 - (*p* - hydroxyphenylazo)-, 2836^{6}.
$C_{13}H_{10}N_2O_4$ Benzaldehyde, *p* - (2,3,4 - trihydroxyphenylazo)-, 2836^{5}.
Phenol, *m* - nitro-, carbanilate, 175^{7}.
$C_{13}H_{10}N_2O_4S$ 3 - Indazolol, 2 - phenyl-, acid sulfite, 1-oxide, 1805^{9}.
$C_{13}H_{10}N_2O_5$ Ether, benzyl 2,4 - dinitrophenyl, 2319^{7}, 3694^{7}.
—, 4,6 - dinitro - *o* - tolyl phenyl, 2666^{8}.
2 - Propanone, 1 - (2,4 - dinitro - 1 - naphthyl)-, 2325^{3}.
$C_{13}H_{10}N_2O_6$ Ether, 4,6 - dinitro - *o* - anisyl phenyl, 2667^{2}.
$C_{13}H_{10}N_2O_7S$ Phenol, 2,4 - dinitro-, *p* - toluenesulfonate, 2816^{2}.
$C_{13}H_{10}F_2S$ Benzothiazole, 1 - (*m* - aminophenyl)-, 1236^{8}.
$C_{13}H_{10}N_4O$ *C* - Hydroxydiphenyltetrazolium betaine, *and salts*, $1223^{7,8}$.
6 - Isoindazolol, 7 - phenylazo-, 1623^{1}.
$C_{13}H_{10}N_4S$ Diphenyltetrazolium thiobetaine, 1224^{1}.
$C_{13}H_{10}N_6O$ Nitrosoiminodiphenyltetrazolium betaine, and isomer, *and salts*, $1224^{3,4}$.
$C_{13}H_{10}O$ (See also *Benzophenone.*)
9-Fluorenol, 1073^{6}.
$C_{13}H_{10}OS$ 4,1 - *β* - Naphthothiopyrone, 2,3-dihydro-, 204^{2}.
$C_{13}H_{10}O_2$ 1 - Acrylonaphthone, *β* - hydroxy-, 1590^{9}.
Benzophenone, *p*-hydroxy-, 2158^{7}.
Fluorenone hydrate, 1073^{6}.
$C_{13}H_{10}O_3$ Carbonic acid, di-Ph ester, 1605^{2}.
3 - Pentadienone, 1,5 - di - 2 - furyl-, 413^{7}, 3005^{1}.
Salicylic acid, phenyl ester, 1030^{2}.
$C_{13}H_{10}O_4$ 1 - Naphthoic acid, 2 - hydroxy-, acetate, 1226^{5}.
3(2),2′ - Spiro[furan - indan] - 2,1′,3′ - trione, 4,5 - dihydro - 5 - methyl-, 185^{9}.
$C_{13}H_{10}O_6$ Compd., m. 156°, from atromentin, 406^{8}.
$C_{13}H_{10}O_7S$ Benzenesulfonic acid, *o* - (2,3,4-trihydroxybenzoyl)-, *and* NH_4 *salt*, $2491^{1,2}$.
$C_{13}H_{10}S_2$ 1,3 - Benzodisulfole, 2 - phenyl-, 3290^{2}.
$C_{13}H_{11}AsClN$ Phenarsazine, 1 - chloro - 1,6-dihydro - 3 - methyl-, 1606^{9}.
$C_{13}H_{11}AsClNO_4$ *m* - Arsanilic acid, *N* - benzoyl - 5 - chloro - 4 - hydroxy-, P 2504^{6}.
$C_{13}H_{11}AsN_2O_3S$ 1 - Benzothiazole - *p* - benzenearsonic acid, amino-, 1080^{3}.
$C_{13}H_{11}AsN_2O_7$ Arsanilic acid, *N* - (4 - hydroxy-3-nitrobenzoyl)-, 394^{8}.
—, hydroxy - *N* - *m* - nitrobenzoyl-, P 970^{6}, *and salts*, $2318^{4,4}$.

$C_{13}H_{11}AsN_2O_6$ Arsanilic acid, hydroxy - *N*-(4 - hydroxy - 3 - nitrobenzoyl)-, 2318[6,7].
$C_{13}H_{11}Br$ Biphenyl, bromomethyl-, 1988[1,2].
Naphthalene, 1 - *β* - bromoallyl-, 899[6].
$C_{13}H_{11}BrN_2O$ Isoharmine, bromo-, 1994[2].
$C_{13}H_{11}BrO_2$ 2 - Propionaphthone, 4 - bromo - 1-hydroxy-, 1617[8].
$C_{13}H_{11}Cl$ Biphenyl, *o* (and *p*) - chloro - *p'* - methyl-, 1988[1].
Naphthalene, 1 - (*γ* - chloroallyl)-, 2676[9].
$C_{13}H_{11}ClMg$ Benzohydrylmagnesium chloride, 2323[7].
$C_{13}H_{11}ClN_2$ Benzaldehyde, *p* - chloro-, phenylhydrazone, 2321[6].
$C_{13}H_{11}ClO$ Ether, benzyl chlorophenyl, 3695[5].
$C_{13}H_{11}ClO_2$ Propionyl chloride, *α* - 1 (and 2)-naphthoxy-, 1617[8,9], 1618[1].
$C_{13}H_{11}ClO_5S$ 2 - Naphthalenesulfonyl chloride, 1 - carboxyoxy-, Et ester, 1234[3].
$C_{13}H_{11}Cl_2N_3O_6$ Phenol, 3,5 - dichloro - 2,4 - dinitro-, *p* - anisidine salt, 1222[8].
$C_{13}H_{11}IN_2$ Benzaldehyde, (iodophenyl)hydrazone, 1794[9].
$C_{13}H_{11}IN_2O$ Salicylaldehyde, (iodophenyl)hydrazone, 1794[9].
$C_{13}H_{11}I_3$ Diphenyliodonium iodide, CHI_3 addn. compd., 2815[9].
$C_{13}H_{11}N$ Aniline, *N* - benzal-, 174[4].
Carbazole, 3-methyl-, 2831[4].
9 - Fluorylamine, 188[1], 1073[8].
$C_{13}H_{11}NO$ Benzanilide, 1745[8].
Benzophenone, oxime, 1615[2].
$C_{13}H_{11}NO_2$ *p* - Cresol, *α* - (*p* - hydroxyphenylimino)-, 2841[5].
Isonicotinic acid, 2 - methyl - 6 - phenyl-, 3296[9].
4,1 - *α* - Naphthisoxazin - 2(3) - one, 3-methyl-, 1617[9].
Nicotinic acid, 2 - methyl - 6 - phenyl-, 3296[8].
$C_{13}H_{11}NO_2S_2$ Disulfide, benzyl *o*-nitrophenyl, 747[8].
$C_{13}H_{11}NO_3$ Ether, benzyl *p* - nitrophenyl, 3695[4].
—, *p* - nitrobenzyl phenyl, 3695[4].
Naphthamide, *N* - acetyl - 3 - hydroxy-, 910[3].
—, 3 - hydroxy-, acetate, 910[3], 1233[4].
$C_{13}H_{11}NO_4$ Ether, 5 (and 3) - nitro - *o* (and *p*)-anisyl phenyl, 1608[9], 1609[1].
2 - Naphthoic acid, 6 (and 7) - nitro-, Et ester, 1075[3].
$C_{13}H_{11}NO_5$ Chromone, 3 - acetyl - 2,6 - dimethyl - 8 - nitro-, 1237[5].
Propionic acid, *α* - (nitronaphthoxy)-, 1617[7,8], 1618[1,2].
$C_{13}H_{11}NO_6S$ Sulfanilic acid, *N* - (2,3,4 - trihydroxybenzal)-, 1987[1].
$C_{13}H_{11}N_2NaS$ Carbanilide, thio-, Na deriv., 1081[6].
$C_{13}H_{11}N_3O$ Benzaldehyde, *m* (and *p*) - (*p* - aminophenylazo)-, 2836[4,6].
$C_{13}H_{11}N_3O_3$ Benzaldehyde, *m* - hydroxy, *p*-nitrophenylhydrazone, 1986[4].
Salicylaldehyde, *o* - nitrophenylhydrazone, 745[9].
$C_{13}H_{11}N_3S$ 4,1,2 - Isobenzothiodiazine, 2,3-dihydro - 3 - phenylimino-, 745[8].
$C_{13}H_{11}N_5O_2$ Formaldehyde, nitrophenylazo-, phenylhydrazone, 1223[7].
$C_{13}H_{11}N_5O_3S$ Benzenesulfonic acid, *p* - (6 - amino - 7 - isoindazolylazo)-, 1623[2].
$C_{13}H_{12}$ Biphenyl, *m* (and *p*) - methyl-, 1987[9], 1988[1].
$C_{13}H_{12}AsBr$ Arsine, (*p* - bromophenyl)methylphenyl-, 393[4].
$C_{13}H_{12}AsClN_2O_4$ Arsanilic acid, *N* - (3 - amino-4 - chlorobenzoyl)-, *and salts*, 394[7].
$C_{13}H_{12}AsClO$ Arsine, chloromethyl(*o* - phenoxyphenyl)-, 2839[4].
$C_{13}H_{12}AsNO_2$ Phenazarsinic acid, 3 - methyl-, *and salts*, 1607[1].
$C_{13}H_{12}AsNO_5$ Arsanilic acid, benzoylhydroxy-, P 2563[9].
$C_{13}H_{12}AsN_3O_9S$ Arsanilic acid, 3 - nitro - *N*-(3 - nitro - *p* - tolylsulfonyl)-, 2838[7].
$C_{13}H_{12}BrNO_2$ Ethanol, 2 - bromo-, 1 - naphthalenecarbamate, 1232[9].
$C_{13}H_{12}BrNO_4$ Naphthalenemethylamine, 5-bromo-, oxalate, 1216[6].
$C_{13}H_{12}BrN_5$ Formamide, (*o* - bromophenylazo)-, phenylhydrazone, 1224[2].
$C_{13}H_{12}Br_2N_2O$ Cresol, dibromo - *α* - (*α* - phenylhydrazino)-, 1610[2,3].
$C_{13}H_{12}Br_2N_4$ Benzoic acid, hydrazide, 2,4 - dibromophenylhydrazone, 1085[3].
$C_{13}H_{12}ClNO_2$ Ethanol, 2 - chloro-, 1 - naphthalenecarbamate, 1232[9].
$C_{13}H_{12}ClN_3$ 2,6 - Lutidine, 4 - (*p* - chlorophenylazo)-, 1808[5].
$C_{13}H_{12}ClN_5$ 4 - Amino - 1,2 - diphenyl - 1,2,3,5-tetrazolium chloride, 1224[3].
Formamide, (*o* - chlorophenylazo)-, phenylhydrazone, *and -HCl*, 1224[2].
$C_{13}H_{12}INO_2$ 3 - Pyrrolecarboxylic acid, 4 - iodo-2,5 - dimethyl - 1 - phenyl-, *and Ag salt*, 597[3].
$C_{13}H_{12}IN_3O_4$ 2 - (2,4 - Dinitrobenzyl) - 1 - methylpyridinium iodide, 204[4].
$C_{13}H_{12}I_2N_4S$ Formic acid, phenylazothiol-, phenylhydrazone, diiodide, 1223[9].
$C_{13}H_{12}MnN_5O_4$ 4 - Amino - 1,2 - diphenyl-1,2,3,5 - tetrazolium permanganate, 1224[3].
$C_{13}H_{12}N_2O$ Benzanilide, *o* - amino-, 1806[4].
Carbanilide, 174[5], 2666[5].
Xenylamine, *N* - methyl - *N* - nitroso-, 2848[2].
$C_{13}H_{12}N_2OS$ Aniline, *N* - methyl - *N* - nitroso-*p*-phenylmercapto-, 371[7].
Urea, (*p* - phenoxyphenyl)thio-, 1603[4].
$C_{13}H_{12}N_2O_2$ Benzopyranoxdiazine, trimethyl-, 1411[7].
3 - Indenopyrazolecarboxylic acid, 2,4-dihydro - (?), Et ester, 1078[1].
Urea, *α* - acetyl - *β* - 1 - naphthyl-, 2319[5].
—, (*p* - phenoxyphenyl)-, 1603[4].
$C_{13}H_{12}N_2O_3$ Benzaldehyde, 2,3,4 - trihydroxy-, phenylhydrazone, 1987[4].
5 - Pyrimidinecarboxylic acid, 2 - *p* - anisyl-4-methyl-, 206[5].
$C_{13}H_{12}N_2O_4$ Propionamide, *α* - (nitronaphthoxy)-, 1617[8], 1618[1,2].
$C_{13}H_{12}N_2O_5S$ Sulfanilic acid, 3 - nitro-, *p* - tolyl ester, P 917[6].
$C_{13}H_{12}N_2O_6S$ Benzenesulfonic acid, 2 - amino-5-nitro-, *o*-anisyl ester, P 917[5].
$C_{13}H_{12}N_2S$ Carbanilide, thio-, 174[5], 1920[5].
$C_{13}H_{12}N_4O_2$ Anthranilaldehyde, *p* - nitrophenylhydrazone, 1986[4].
Benzaldehyde, *m* - amino, *p* - nitrophenylhydrazone, 1986[4].
$C_{13}H_{12}N_4O_3$ Anthranilic acid, *β* - (*m* - nitrophenyl)hydrazide, 206[8].
$C_{13}H_{12}N_4O_8$ 1 - Methylpyridinium 3 - methoxy picrate, 1394[9].
1 - Methylpyridinium 4,5,6 - trinitroguaiacolate, 1395[1].
$C_{13}H_{12}N_4S$ Formic acid, phenylazothiol-, phenylhydrazone, 1223[9].

Semicarbazide, 1 - phenyl - 4 - phenylimino-3-thio-, 3660[8].
$C_{13}H_{12}N_6O_3$ Carbohydrazide, α, δ - dinitroso-α, δ - diphenyl-, 1223[8].
$C_{13}H_{12}O$ Benzohydrol, 2996[3], 2999[9].
Ether, benzyl phenyl, 2835[1], 3695[4].
—, phenyl o - tolyl, 748[8].
Phenol, o - benzyl-, P 1631[5].
$C_{13}H_{12}O_2$ Acetonaphthone, methoxy-, 1616[7,9], 1617[1].
Ether, m (and p) - anisyl phenyl, 1608[9].
Resorcinol, 4 - benzyl-, 1230[6].
$C_{13}H_{12}O_3$ Chromone, 3 - acetyl - 2,6 (and 2,7)-dimethyl-, 1237[1].
Cyclopentanone, 3,4 - di - 2 - furyl-(?), 413[3].
Δ²-Cyclopentenone, 2 - hydroxy - 3 - methyl-, benzoate, 2484[9].
1 - Naphthoic acid, 2 - ethoxy-, 1617[9].
Phloroglucinol, 2 - benzyl-, 1225[8].
Propionic acid, α - 1 (and 2) - naphthoxy-, 1617[8,9], 1618[1].
$C_{13}H_{12}O_3S$ p - Toluenesulfonic acid, Ph ester, 2666[9].
$C_{13}H_{12}O_4$ Carbonic acid, 2 - ethoxy - 1 - naphthyl ester, 1617[5].
Chromone, 3 - hydroxy - 2,6 - dimethyl-, acetate, 1237[8].
3 - Furancarboxylic acid, 2,3 - dihydro 2-keto-5-phenyl-, Et ester, 404[6].
2 - Indanglyoxylic acid, 1 - keto-, Et ester, 1077[6], 1620[3].
$C_{13}H_{12}O_5$ 1,2 - Benzopyran - 3 - carboxylic acid, 6,8[1] - dihydro - 2,6 - diketo - 5,7,8 - trimethyl-, *and salts*, 2320[6].
$C_{13}H_{12}O_5S$ 1 - Naphthol - 4 - sulfonic acid, 2-propionyl-, 1617[3].
$C_{13}H_{12}O_6$ Δ¹⁽²⁾·α - Isobenzofuranglycolic acid, 5-hydroxymethyl - 2 - keto-, Et ester, 184[2].
$C_{13}H_{12}O_7$ Glucuronic acid, monobenzoate, lactone, 3689[3].
$C_{13}H_{12}O_8$ Benzoic acid, trihydroxy-, triacetate, 1613[9], 2489[1].
Gallic acid, triacetate, 1613[8].
$C_{13}H_{12}S$ Sulfide, benzyl phenyl, 748[9].
$C_{13}H_{13}AsBrNO_2$ Arsinic acid, (o - bromophenyl)-(o - methylaminophenyl)-, 1606[1].
$C_{13}H_{13}AsClN_3O_4$ Benzenearsonic acid, 3 - amino-4 - (3 - amino - 4 - chlorobenzamido)-, 394[7].
$C_{13}H_{13}AsN_2O_3S$ Toluenesulfonanilide, amino-arsinoso-, 2838[6], 3746[9].
$C_{13}H_{13}AsN_2O_5$ Arsanilic acid, N - (3 - amino-4 - hydroxybenzoyl)-, *and Na salt*, 394[8].
$C_{13}H_{13}AsN_2O_6$ Arsanilic acid, N - (3 - amino - 4-hydroxybenzoyl)hydroxy-, *and salts*, 2318[6,7].
$C_{13}H_{13}AsN_2O_7$ Arsanilic acid, N - (3 - amino-benzoyl)hydroxy-, *and salts*, 2318[4,8].
$C_{13}H_{13}AsN_2O_7S$ Arsanilic acid, N-(3-nitro-p-tolylsulfonyl)-, 2838[6].
$C_{13}H_{13}BrN_2O$ Harmaline, bromo-, 1994[1].
$C_{13}H_{13}BrN_2O_2$ 3 - Pyrazolecarboxylic acid, 1-benzyl - 4 - bromo - 5 - methyl-, Me ester, 3006[6].
2 - Pyrrolecarboxylic acid, 5 - (anilinomethyl)-4-bromo-3-methyl-, 2160[4].
$C_{13}H_{13}BrN_2O_4$ Valeric acid, α, β, γ - triketo-, Et ester, m - bromophenylhydrazone, 2483[8].
$C_{13}H_{13}BrPb$ Plumbane, bromomethyldiphenyl-, 2669[1].
$C_{13}H_{13}ClN_2O_2$ 1 - Imidazoleacetic acid, 5 - chloro-2-phenyl-, Et ester, 1624[1].
$C_{13}H_{13}ClN_2O_4$ Glyoxime, chloro - p - tolyl-, diacetate, 1084[9].
Valeric acid, α, β, γ - triketo-, Et ester, m-chlorophenylhydrazone, 2483[8].
$C_{13}H_{13}Cl_2N_3$ Lutidine, 4 - [β - (2,4 - dichlorophenyl)hydrazino]-, *-HCl*, 1808[6].
$C_{13}H_{13}Cl_3O_4$ p - Toluic acid, 5 - methoxy - 2-(β - trichloro - α - hydroxyethyl)-, acetate, 40[9].
$C_{13}H_{13}IN_2O_2$ 1 - Methyl - 2(and 4) - p - nitrobenzylpyridinium iodide, 204[3,6].
$C_{13}H_{13}IN_4O_2$ 2 - Formyl - 1 - methylpyridinium iodide, p - nitrophenylhydrazone, 1627[8].
$C_{13}H_{13}N$ Benzylamine, N - phenyl-, 174[7], 2155[7].
Xenylamine, N - methyl-, *and -HCl*, 2848[2].
$C_{13}H_{13}NOS$ Aniline, tolylsulfinyl-, 3448[6].
p - Toluenesulfinanilide, 397[8].
$C_{13}H_{13}NO_2$ Carbazolecarboxylic acid, 5,6,7,8 tetrahydro-, 2326[7].
Phthalimide, N - Δ² - isopentenyl-, 1057[8].
Propionamide, α 1(and 2) - naphthoxy-, 1617[8,9], 1618[1].
4(1) - Pyridone, 1 p - phenetyl-, *and perchlorate*, 586[5,6].
$C_{13}H_{13}NO_2S$ Aniline, m - (benzylsulfonyl)-, *-HCl*, 1063[1].
p-Phenetidine, N-2-thenoyl-, 2854[8]
$C_{13}H_{13}NO_3$ Chromone, 3 - acetyl - 2,6 - dimethyl-, oxime, 1237[2], 1410[6].
Δ²-Cyclopentenone, 2 - hydroxy - 3 - methyl-, carbanilate, 2484[9].
Naphthalenecarbamic acid, β - hydroxyethyl ester, 361[4].
Propionic acid, α - (4 - amino - 1 - naphthoxy)-, 1617[8].
$C_{13}H_{13}NO_4$ 2 - Indanglyoxylic acid, 1 - keto-, Et ester, oxime, 1078[1].
$C_{13}H_{13}NS$ Aniline, m - (benzylmercapto)-, *-HCl*, 1063[1].
—, N - methyl - p - phenylmercapto-, 371[7]
$C_{13}H_{13}N_2O_2P$ Benzodiazphospholium, p-tolyloxy-P-oxodihydro-, 914[1].
$C_{13}H_{13}N_2O_3$ See *Procaine*.
$C_{13}H_{13}N_3$ Guanidine, α, γ - diphenyl-, *perchlorate*, 2163[1].
$C_{13}H_{13}N_3O_2$ 1,4′ - Spiro[Δ² - cyclohexene - piperidine], 3′,5′ - dicyano - 2′,6′ - diketo-3 - methyl-, 2832[4].
$C_{13}H_{13}N_3O_2S$ Sulfanilic acid, benzalhydrazide, 1409[8].
$C_{13}H_{13}N_3O_6$ Valeric acid, α, β, γ - triketo, Et ester, nitrophenylhydrazone, 2483[8].
$C_{13}H_{13}N_4NaO_6S$ 1,2,3 - Triazole - 4 - carboxylic acid, 1 - (p - acetamidophenylsulfonyl)-5 - hydroxy-, Et ester, Na deriv., 1409[7].
$C_{13}H_{13}N_5$ Formamide, phenylazo-, phenylhydrazone, *and -HCl*, 1224[1].
$C_{13}H_{13}N_5O_7$ Pyridine, 4 - dimethylamino-, picrate, 1238[7].
$C_{13}H_{14}AsN_2O_3S$ p - Toluenesulfonanilide, 3,2′-diamino-4′-arsinoso-, 2838[7].
$C_{13}H_{14}AsN_3O_4$ Benzenearsonic acid, 3-amino-4-(3-aminobenzamido)-, 394[1].
$C_{13}H_{14}AsN_3O_5$ Benzenearsonic acid, 5 - amino-4 - (3 - aminobenzamido) - 2 - hydroxy-, *and salts*, 2318[8].
$C_{13}H_{14}As_2N_2O_5S$ Methanesulfonic acid, 5 - [(3-amino - 4 - hydroxyphenyl)arseno] - 2 - hydroxyanilino-, 264[8].
$C_{13}H_{14}As_2N_2O_9$ m - Arsanilic acid, N, N′ - carbonylbis[4-hydroxy-, P 970[6].

$C_{13}H_{14}BrN$ Methylphenyldipropargylammonium bromide, 390[1].
$C_{13}H_{14}BrNO$ 1 - *p* - Phenetylpyridinium bromide, 586[3].
$C_{13}H_{14}BrN_3$ 2 - Pyrrolealdehyde, 4 - bromo - 3,5-dimethyl-, phenylhydrazone, 2160[1].
$C_{13}H_{14}Br_2O_4$ Butyric acid, anisyldibromoketo, ethyl ester, 3164[7].
$C_{13}H_{14}ClNO$ 1 - *p* - Phenetylpyridinium chloride, *HgCl₂ compd.*, 586[3].
$C_{13}H_{14}ClNO_3$ Isovaleryl chloride, α - keto - β methyl-, oxime, Bz deriv., 360[3].
$C_{13}H_{14}ClNO_4$ Cyclohexanol, 2 - chloro-, *p*-nitrobenzoate, 2831[7].
$C_{13}H_{14}ClNO_5$ 1 - *p* - Phenetylpyridinium perchlorate, 586[3].
$C_{13}H_{14}ClN_3$ 2,6 - Lutidine, 4 - [β - (*p* - chlorophenyl)hydrazino]-, *and -HCl*, 1808[5].
$C_{13}H_{14}Cl_2O_2Te$ 1,2 - Telluropyran - 3,5(4,6) dione, 4 - benzyl - 2 - methyl-, 1,1 - dichloride, 413[5].
$C_{13}H_{14}Fe_3NO_{17}$ + $2H_2O$, 1186[6].
$C_{13}H_{14}INO_2$ Propionic acid, α - iodo-, 1 - naphthylamine salt, 2978[2].
$C_{13}H_{14}N_2O$ Harmaline, 1994[1].
Urea, α,α - dimethyl - β - 1 - naphthyl-, 2319[5].
-, α - ethyl β - 1 - naphthyl-, 2319[5]
$C_{13}H_{14}N_2O_2$ Pyrazolecarboxylic acid, dimethyl phenyl-, Me ester, 2493[8].
- -, methylphenyl-, Et ester, 2856[4,5].
$C_{13}H_{14}N_2O_3$ Barbituric acid, 5 - benzyl - 5 - ethyl-, 458[7].
Chromone, 3 - acetyl - 2,6 - dimethyl, dioxime, 1237[2], 1410[5].
Hydantoin, 5 - anisal - 1,3 - dimethyl, 366[9].
$C_{13}H_{14}N_2O_4$ Valeric acid, α,β,γ triketo-, Et ester, phenylhydrazone, 2483[5].
$C_{13}H_{14}N_2O_5$ 3 - Hydantoinacetic acid, 5 - *p*-hydroxybenzyl - α - methyl-, 366[7].
Pyruvic acid, (methylphenylcarbamyl)nitroso, Et ester, 2823[2].
Succinanilic acid, diketomethyl-, ethyl ester, oxime, 3403[7].
$C_{13}H_{14}N_2O_8$ 1,3 - Dioxolane - 4 - carbinol, 2,2-dimethyl-, 3,5 - dinitrobenzoate, 740[2].
$C_{13}H_{14}N_2S$ Urea, α - ethyl - β - 1 - naphthylthio-, 2835[3].
$C_{13}H_{14}N_4O$ Antipyrine, cyanomethylamino-, 2857[6].
Carbohydrazide, α,δ - diphenyl-, 1770[7].
$C_{13}H_{14}N_4O_6$ Hydroxylamine, β - (4,6 - dinitro-*m* anisyl)-, PhNH₂ compd., 2667[4].
$C_{13}H_{14}N_4O_6S$ Malonamic acid, *N* - (*p* - acetamidophenylsulfonyl) - α diazo-, Et ester, 1409[7].
1,2,3 - Triazole - 4 - carboxylic acid, 1-(*p* - acetamidophenylsulfonyl) - 5 - hydroxy-, Et ester, 1401[7].
$C_{13}H_{14}N_4O_7$ Pyrrole, 2 - ethyl - 4 - methyl-, picrate, 1236[5].
$C_{13}H_{14}N_4S$ Semicarbazide, 1 - (*o* - aminophenyl)-4 - phenylthio-, 745[6].
$C_{13}H_{14}O$ Acetophenone, cyclopentenyl-, 3447[7].
$C_{13}H_{14}OS$ 1,4 - α - Naphthothiopyrone, 2,3,7,-8,9,10-hexahydro-, 202[3], 204[2].
$C_{13}H_{14}O_2$ Δ^2 - Cyclohexenol, benzoate, 1061[1].
$C_{13}H_{14}O_2Te$ 1,2 - Telluropyran - 3,5(4,6) - dione, 4 - benzyl - 2 - methyl-, 413[5].
$C_{13}H_{14}O_3$ Cinnamic acid, α - acetyl-, Et ester, 3006[2].
Cyclohexanone, 2 - hydroxy-, benzoate, 2665[5].
3 - Peptanone, 1,5 - di - 2 - furyl-, 413[2].
$C_{13}H_{14}O_4$ Benzoic acid, *m* - (β - acetyl - γ - hydroxy - Δ^2 - butenyl)-, 2843[2].
Δ^3 - 2 - Butenone, 4 - (2 - hydroxy - *m* - anisyl)-, acetate, 2833[4].
Crotonic acid, α - benzoyl - β - hydroxy-, Et ester, 3006[2].
Pyruvic acid, anisal-, ethyl ester, 3164[7].
$C_{13}H_{14}O_6$ Acetophenone, α,4 - dihydroxy - 3 - methoxy-, diacetate, 3457[6].
1 - Isobenzofuranacetic acid, 1,2 - dihydro-2 - keto - 4,5 - dimethoxy-, Me ester, 2331[2].
$C_{13}H_{14}O_8$ Glucuronic acid, monobenzoate, 3689[1].
—, benzoyl-, 1838[2].
$C_{13}H_{15}AsN_2O_5S$ Arsanilic acid, aminotolylsulfonyl-, 3746[9]; *and -HCl*, 2838[6].
$C_{13}H_{15}AuCl_4O_2$ 7 - Methoxy - 2,3,4 - trimethylbenzopyrylium chloroaurate, 2499[1].
$C_{13}H_{15}AuCl_4O_3$ 5,7 - Dimethoxy - 2,4 - dimethylbenzopyrylium chloroaurate, 2498[9].
$C_{13}H_{15}ClO_2$ Cyclohexanol, 2-chloro-, benzoate, 2831[7].
$C_{13}H_{15}ClO_3$ Caproic acid, ε - *p* - chlorobenzoyl-, 1229[6].
$C_{13}H_{15}Hg_2NO_5$ *o* - Acetotoluide, ?,? - bis(acetoxymercuri), 2318[1].
$C_{13}H_{15}N$ Carbazole, 1,2,3,4 - tetrahydro - 9-methyl-, 913[3].
Quinoline, 1,2(or 1,4) - dihydro - 1,4,6-(or 1,2,6) - trimethyl - 2 (or 4) - methylene-, 2862[1].
—, 2-isobutyl-, 1082[1].
$C_{13}H_{15}NO$ 2 - Furanmethylamine, *N* - benzyl-*N*-methyl-, 390[7].
$C_{13}H_{15}NO_4$ 2 - Indolecarboxylic acid, 5,6 - dimethoxy-, Et ester, 1604[4].
Phthalimide, 3 - ethoxy - *N* - ethyl - 4 - methoxy-, 3295[2].
$C_{13}H_{15}NO_5$ Isatic acid, *N* - carboxy-, di-Et ester, 2997[7].
Meconin, 2 - (acetamidomethyl)-, 2331[1].
$C_{13}H_{15}NO_6$ Cinnamic acid, 2,3 - diethoxy - 5 - nitro-, 1793[1].
- , dimethoxynitro-, Et ester, 1792[9].
$C_{13}H_{15}NS$ 2 - Thiophenemethylamine, *N* - benzyl - *N* - methyl-, 390[6].
$C_{13}H_{15}N_3O$ Cyclopentanenitrile, 1 - (*N* - nitroso-*p*-toluino)-, 2831[3].
4 - Pyrazolecarboxanilide, 1,3,5 - trimethyl-, 2857[1].
$C_{13}H_{15}N_3O_3S$ Benzenesulfonic acid, (5-ethyl 3-methyl-2-pyrryl)-, 1236[5].
$C_{13}H_{15}N_3O_4$ 4 - Piperidinepropionic acid, 3,5-dicyano - 2,6 - diketo - 4 - methyl-, Et ester, 172[8].
$C_{13}H_{15}N_3O_8$ Imidazole, 4 - (*o* - aminophenyl)-, tartrate, 395[6].
$C_{13}H_{15}N_3S$ 2(3) - Thiazolone, 3 - methyl - 4 - phenyl-, isopropylidenehydrazone, 416[6].
$C_{13}H_{15}N_5O_3S$ 1,2,3 - Triazole - 4 - carboxamide, *N* - benzylsulfonyl - 5 - hydroxy - 1 - isopropylideneamino-, 1409[5].
$C_{13}H_{15}N_5O_7$ Pyrazole, 1,3,4,5 - tetramethyl-, picrate, 2857[1].
$C_{13}H_{16}$ *p*-Cymene, 2-propargyl-, 587[9].
$C_{13}H_{16}AsN_3O_5S$ Benzenearsonic acid, 3-amino-4 - (3 - amino - *p* - tolylsulfonamido)-, 2838[7].
$C_{13}H_{16}BrNO_2$ Cyclohexanol, 2-bromo-, carbanilate, 1599[3].
$C_{13}H_{16}BrNO_3$ Caproic acid, ε - benzamido - α - bromo-, 2147[7].

$C_{13}H_{16}Br_2$ Cyclohexane, 1 - benzyl - 1,2 - dibromo-, 2665[9].
$C_{13}H_{16}Br_2O_4$ Veratrole, 4 - bromo - 3 - (β - bromo-α - methoxypropyl) - 5,6 - methylenedioxy-, 3450[3].
$C_{13}H_{16}HgI_3N$ Quinoline, complex salt with C_4H_9I and HgI_2, 3695[8,9].
$C_{13}H_{16}IN$ Quinoline, complex salt with BuI, and with Me_2CHCH_2I, 3695[7].
$C_{13}H_{16}N_2$ Cyclopentanenitrile, 1 - *p* - toluino-, 2831[3].
$C_{13}H_{16}N_2O$ Lepidine, methylaminoethoxy-, P 3212[7].
$C_{13}H_{16}N_2O_2$ Benzoic acid, *m*(*o* and *p*) - (cyclohexylidenehydrazino)-, 2326[7].
$C_{13}H_{16}N_2O_3$ Cyclopentanecarboxylic acid, 1-(*N* - nitroso - *p* - toluino)-, 2831[3].
Tyrosine, *N* - (cyanomethyl)-, Et ester, 3283[4].
$C_{13}H_{16}N_2O_4$ Isobutyric acid, pentamethylenebis[α-amino-, *Cu salt*, 1961[6].
$C_{13}H_{16}N_4O_2$ Δ^2 - Cyclohexenediacetamide, α,α′-dicyano-3-methyl-, 2832[5].
1,4′ - Spiro[Δ^2 - cyclohexene - piperidine], 3′,5′ - dicyano - 2′,6′ - diketo - 3 - methyl-, NH_4 deriv., 2832[5].
$C_{13}H_{16}N_4O_3$ Cyclohexanone, 4 - (*m* - nitrophenyl)-semicarbazone, 175[6].
$C_{13}H_{16}O$ Δ^1 - 3 - Pentenone, 4,4 - dimethyl - 1-phenyl-, 41[6].
Pentenophenone, ethyl-, 3447[8].
$C_{13}H_{16}OS$ 1,4 - Thiopyrone, tetrahydro - 2,2-dimethyl - 6 - phenyl-, 201[5].
$C_{13}H_{16}O_2$ Ether, benzyl 1,2 - epoxycyclohexyl, 2665[4].
2,4 - Hexanedione, 3 - benzyl-, 413[4].
$C_{13}H_{16}O_2S$ Propionic acid, β - (1,2,3,4 - tetrahydro - 1 - naphthylmercapto)-, 202[2].
$C_{13}H_{16}O_3$ 1,3 - Butanedione, 1 - (6 - methoxy-2,4-xylyl)-, 1238[3].
Δ^1 - 3 - Hexenone, 1 - (4 - hydroxy - *m* - anisyl)-, 387[1].
Phenol, 2 - ethoxy - 5 - propenyl-, acetate, 402[4].
$C_{13}H_{16}O_4$ 2 - Butanol, 4 - (3,4 - methylenedioxyphenyl)-, acetate, 739[8].
Cinnamic acid, 2,3 - diethoxy-, 1793[1].
$C_{13}H_{16}O_5$ Acetic acid, (2,3 - dimethoxybenzoyl)-, Et ester, 1065[8].
Glyoxylic acid, (4 - methoxy - 6 - methyl-*m*-phenetyl)-, Me ester, 765[3].
$C_{13}H_{16}O_6$ Acetophenone, α - hydroxy - 3,4 - dimethoxy-, methoxyacetate, 1597[5].
$C_{13}H_{16}O_7$ Isophthalic acid, 4,5,6 - trimethoxy-, di-Me ester, 1613[4].
$C_{13}H_{16}O_7S$ (1,4)(1,5) - Glucoseanhydride, 6 - *p* - toluenesulfonyl-, 2985[5].
$C_{13}H_{17}IN_2$ 1 - Ethyl - 2,5 - dimethyl - 3 - phenylpyrazolium iodide, 2856[3].
Pyrazole, 1 - benzyl - 3(and 5) - methyl-, ethiodide, 3006[4].
$C_{13}H_{17}N$ Acridine, 1,2,3,4,4_1,5,10,10_1 - octahydro-, 1628[6].
Hydrocinnamonitrile, α-butyl-, 2657[1].
—, α,α-diethyl-, 2657[1].
Indole, 3-amyl-, 598[7].
$C_{13}H_{17}NO$ Cyclohexanone, 2 - benzyl-, oxime, 2665[4].
$C_{13}H_{17}NO_2$ Cyclopentanecarboxylic acid, 1-*p*-toluino-, 2831[3].
Cyclopentanol, 2 - methyl-, carbanilate, 1790[4,5].
$C_{13}H_{17}NO_4$ α - Toluic acid, carbethoxyethylamino-, *NH_4 salt*, 3164[2].
—, carboxyamino-, diethyl ester, 3164[2].
$C_{13}H_{17}NO_4S$ 4 - Thiomorpholineacetic acid, α-benzyl-, 1-dioxide, 40[4].
$C_{13}H_{17}NO_4S_2$ Succinic acid, dithiocarbethoxyoxy-, $PhNH_2$ salt, 372[8].
$C_{13}H_{17}NO_6$ Glucosyl - 3 - amine, Bz deriv., 2662[9].
$C_{13}H_{17}N_3O$ See *Pyramidone*.
$C_{13}H_{17}N_3O_2$ Cyclopentanecarboxamide, 1-(*N*-nitroso-*p*-toluino)-, 2831[3].
$C_{13}H_{17}N_3O_3$ Acetophenone, 4 - hydroxy - 3 - methyl-, propionate, semicarbazone, 1238[3].
Cyclohexanone, 2 - methoxy-, *p* - nitrophenylhydrazone, 2665[4].
$C_{13}H_{17}N_5O_7$ Urea, α - picryl - α,β - dipropyl-, 374[2].
$C_{13}H_{17}N_7O_5$ Guanidine, α - ethyl-, picrolonate, 3284[7].
$C_{13}H_{18}N_2O$ Cyclohexanone, 2 - methoxy-, phenylhydrazone, 2665[3].
Cyclopentanecarboxamide, 1 - *p* - toluino-, 2831[3].
$C_{13}H_{18}N_2OS$ Δ^2 - Thiazoline, 5 - ethoxy - 2 - (2,6-xylylamino)-(?), 415[7].
$C_{13}H_{18}N_2O_2$ *p* - Isovalerotoluide, α - keto - β - methyl-, oxime, 360[3].
Lysine, *N* - benzal-, 1815[2].
$C_{13}H_{18}N_2O_3$ Lysine, N^ϵ - benzoyl-, 2147[7].
Lysine, *N*-salicylal-, 1815[2].
$C_{13}H_{18}N_2O_4$ 2,5 - Piperazinedione, 1,4 - diacetyl-3-isobutyl-6-methylene-, 2682[6].
$C_{13}H_{18}N_2O_5S$ Alanine, *N* - (*N* - tolylsulfonylsarcosyl)-, 3298[6].
$C_{13}H_{18}N_4O_2$ Arginine, N^α - benzal , 1815[2].
$C_{13}H_{18}N_4O_3$ Arginine, N^α - salicylal-, *and $NaNO_3$ compd.*, 1815[2].
$C_{13}H_{18}N_4O_3S$ Leucyl azide, *N* - tolylsulfonyl-, 3298[6].
$C_{13}H_{18}N_4O_9$ Alanine, Bu and isobutyl esters, picrate, 1055[2,3].
$C_{13}H_{18}N_6O_7$ Guanidine, β - (γ - methyl - Δ^3 - butenyl)-, compd. with 2,4,6 - trinitro-*m*-cresol, 1057[9].
$C_{13}H_{18}O$ Ether, benzyl cyclohexyl, 718[6].
Δ^5 - 2 - Heptenol, 2 - phenyl-, 1602[8].
2 - Hexenol, 2 - benzyl-, 1602[8].
$C_{13}H_{18}O_2$ Cumic acid, Pr ester, 1793[5]; iso-Pr ester, 1793[5].
7 - *p* - Cymenecarboxylic acid, Et ester, 2488[4].
Phenethyl alcohol, *p* - isopropyl-, acetate, 1793[5].
Propionic acid, *p* - isopropylbenzyl ester, 2488[2].
$C_{13}H_{18}O_3$ 2 - Butanol, 4 - *p* - anisyl-, acetate, 739[8].
Caprophenone, 2 - hydroxy - 4 - methoxy-, 2995[8].
Enanthophenone, 2,4 - dihydroxy-, 2320[2].
$C_{13}H_{18}O_4$ 2 - Benzofuranpropionic acid, 1,2,3,4,5,6-hexahydro-1-keto-, Et ester, 1989[4].
$C_{13}H_{18}O_5S$ 1,3 - Dioxolane - 4 - carbinol, 2,2 dimethyl-, *p* - toluenesulfonate, 2816[1].
$C_{13}H_{18}O_6$ Glucoside, β - *o* - cresyl-, 605[8].
$C_{13}H_{18}O_7$ See *Salicin*.
$C_{13}H_{18}O_{12}$ Arabinose, tetracarbomethoxy-, isomers, 3285[2].
Xylose, tetracarbomethoxy-, 3285[2].
$C_{13}H_{19}As$ Arsine, cyclohexylmethylphenyl-, 2839[6].
$C_{13}H_{19}BrO_8$ Glucoside, methyl-, bromohydrin, triacetate, 376[3].

—, 2,3,5 - triacetyl - α - methyl-, 6 - bromohydrin, 1596[9].
$C_{13}H_{19}ClN_4O$ 2 - Pentanone, 4 - (*p* - chloroanilino) - 4 - methyl-, semicarbazone, 2837[5].
$C_{13}H_{19}ClO_8$ Glucoside, 2,3,5 - triacetyl - α - methyl-, 6 - chlorohydrin, 1596[9].
$C_{13}H_{19}IO_8$ Glucoside, triacetylmethyl-, 6 - iodohydrin, 742[9].
$C_{13}H_{19}N$ Cyclohexylamine, 2 - benzyl-, *and salts*, 2665[7,8].
1 - Indanamine, *N*, *N* - diethyl-, 755[9].
Quinoline, 1,2,3,4 - tetrahydro - 2 - isobutyl-, *and - HCl*, 1082[2].
$C_{13}H_{19}NO$ Hydrocinnamamide, α - butyl-, 2657[1].
—, *N*, *N* - diethyl-, 2097[5].
$C_{13}H_{19}NO_2$ Benzoic acid, diethylaminoethyl ester, *- HCl*, 2727[2].
1 - Butanol, 3 - dimethylamino-, benzoate, *- HCl*, 1788[6].
Compd., m. 101-2°, from $Et_2C{:}CHCOPh$ and NH_2OH, 3447[8].
Isonicotinic acid, 2 - *tert* - butyl 6 - methyl-, Et ester, 3297[1].
Isovaleranilide, *p*-ethoxy-, 1218[5].
Nicotinic acid, 6 - *tert* - butyl - 2 - methyl-, Et ester, 3296[9].
2 - Pyridineacetic acid, 3,5 - diisobutyl-, 2499[4].
$C_{13}H_{19}NO_3$ Alanine, β - *p* - anisyl-, betaine, *and salts*, 417[6].
Pyrrolecarboxylic acid, ethylmethylpropionyl-, ethyl ester, 3403[6].
$C_{13}H_{19}NO_4$ Ether, 5 - nitro - 2 - propoxybenzyl propyl, 2833[8].
3 - Pyrrolepropionic acid, 5 - carbethoxy - 2 - ethyl-4-methyl-, 1236[6].
$C_{13}H_{19}NO_{11}$ Glucoside, triacetylmethyl-, 6-nitrate, 742[9].
$C_{13}H_{19}N_3O_2$ 2 - Hexanone, 1 - hydroxy - 1 - phenyl-, semicarbazone, 906[6].
2 - Pentanone, 1 - hydroxy - 4 - methyl-1 - phenyl-, semicarbazone, 906[6].
$C_{13}H_{19}N_3O_3$ Ketone, 4 - methoxy - 6 - methyl-*m* - phenetyl methyl, semicarbazone, 765[2].
$C_{13}H_{20}BrNO_2$ α - Carboxybenzyltrimethylammonium bromide, Et ester, 3688[9].
$C_{13}H_{20}N_2$ Isoindoline, 2 - (ε - aminoamyl)-, 418[2].
Piperidine, 1 - [*o* - (aminomethyl)benzyl]-, 418[2].
$C_{13}H_{20}N_2O$ 2(1) - Pyridone, 1 - propyl - 3 - (tetrahydro - 1 - methyl - 2 - pyrryl)-, 2863[1].
Valeramidine, *N'* - *p* - phenetyl-, 1218[6].
$C_{13}H_{20}N_2O_2$ (See also *Procaine.*)
Pentenophenone, ethyl-, oximino-oxime, 3447[8].
Propanol, (diethylamino)-, nicotinate, *- HCl*, 3168[8].
$C_{13}H_{20}N_2O_4$ Crangitine, 2025[4].
Rhamnose, 5 - monomethyl-, phenylhydrazone, 2827[7].
$C_{13}H_{20}N_2O_4S$ Lysine, *N*^α - *p* - tolylsulfonyl-, 3690[4].
Ornithine, *N*^α - methyl - *N*^α - *p* - tolylsulfonyl-, *and - HCl*, 3690[9].
$C_{13}H_{20}N_2O_5$ Galactose, 6 - Me ether, phenylhydrazone, 1597[8].
Talose, methylphenylhydrazone, 904[9].
$C_{13}H_{20}N_4O_4$ 1,3 - Propanediamine, 2 - (2,4-dinitrophenyl) - *N*, *N*, *N'*, *N'* - tetramethyl-, 1414[5].
$C_{13}H_{20}N_4O_8$ 2 - Butanol, 3 - dimethylamino-2 - methyl-, picrate, 2820[7].
$C_{13}H_{20}N_6O_2$ Δ^2 - Cyclohexenone, 5 - furyl - 3-methyl-, semicarbazide - semicarbazone, 3161[2].
$C_{13}H_{20}N_6O_7$ Hexamethylguanidinium picrate, 374[8].
$C_{13}H_{20}O$ Ionone, 2847[7,9].
$C_{13}H_{20}O_2$ Resorcinol, 4-heptyl-, 2320[2].
$C_{13}H_{20}O_2S_2$ Benzaldehyde, bis(γ - hydroxypropyl) mercaptal, 737[4].
$C_{13}H_{20}O_3$ Pyromucic acid, octyl ester, 1620[8].
$C_{13}H_{20}O_4$ 1,4 - Pyrone, 2,6 - diethoxy - 3,5-diethyl-, 2861[8].
$C_{13}H_{20}O_7$ 1,1,2 - Butanetricarboxylic acid, 3 keto-, tri-Et ester, 3690[1].
Δ^2 - 1,1,2 - Butenetricarboxylic acid, 3 hydroxy-, tri-Et ester, 3689[9].
$C_{13}H_{20}O_8$ Isorhamnoside, α - methyl-, triacetate, 1597[1].
Pentaerythritol, tetraacetate, P 1996[5].
$C_{13}H_{20}O_9$ Glucoside, triacetylmethyl-, 742[9].
$C_{13}H_{21}ClN_2O_2$ See *Procaine.*
$C_{13}H_{21}IN_2$ 1 - Propyl - 3 - (tetrahydro - 1 - methyl 2 - pyrryl)pyridinium iodide, *- HI*, 2863[1].
$C_{13}H_{21}N$ Phenethylamine, α - ethyl - *N*, *N*,α-trimethyl-, *and chloroplatinate*, 1053[3].
$C_{13}H_{21}NO_2$ Acetic acid, cyano-, menthyl ester, 43[6].
$C_{13}H_{21}N_3O$ Δ^5 - 2 - Hexenone, 3 - Δ^1 - cyclohexenyl-(?), semicarbazone, 3287[5].
$C_{13}H_{21}N_3O_3$ 5 - Epicamphorcarboxylic acid, Me ester, semicarbazone, 2674[8].
$C_{13}H_{21}N_3O_3S$ Leucine, *N* - tolylsulfonyl-, hydrazide, 3298[6].
$C_{13}H_{22}AsI$ Ethyldimethyl(γ - phenylpropyl) arsonium iodide, 2839[5].
Trimethyl(δ - phenylbutyl)arsonium iodide, 2839[6].
$C_{13}H_{22}BrN$ Benzyltriethylammonium bromide, 3688[6].
$C_{13}H_{22}IN$ Benzyltriethylammonium iodide, 3688[6]
$C_{13}H_{22}N_2$ Cyclohexanenitrile, 1-cyclohexylamino-, *and - HCl*, 2831[8].
1,3 - Propanediamine, *N*, *N*, *N'*, *N'* - tetramethyl - 1 - phenyl-, *and - HCl*, 1053[4].
Pyridine, 2 - ethyl - 1,2 - dihydro - 1 - methyl-3(or 5) - (tetrahydro - 1 - methyl - 2 - pyrryl)-, 2863[2].
$C_{13}H_{22}N_2O$ Cyclohexanenitrile, 1 - (2 - hydroxycyclohexylamino)-, *and di-HCl*, 2831[9].
$C_{13}H_{22}N_2O_7$ Galactonic acid, 6-Me ether, $PhNHNH_2$ salt, 1597[4].
$C_{13}H_{22}O_3$ Ketone, hydroxymethyl 1,2,2,3 - tetramethylcyclopentyl, acetate, 1399[3].
Menthone, 2 - (hydroxymethyl)-, acetate, 2846[2].
$C_{13}H_{22}O_4$ Cyclohexanemalonic acid, diethyl ester, 3160[1].
Malonic acid, monomenthyl ester, 43[6].
$C_{13}H_{22}O_5$ Malonic acid, ethyl(β - vinyloxyethyl)-, di-Et ester, 367[7].
$C_{13}H_{23}NO$ Benzyltriethylammonium hydroxide, 3747[4].
$C_{13}H_{23}NO_3S_2$ Menthylxanthic acid, (carbamylmethyl) ester, 373[4].
$C_{13}H_{23}NO_3$ Cyclohexanecarboxylic acid, 1-(2 - hydroxycyclohexylamino)-, 2831[9].
Nipecotic acid, 1 - amyl - 4 - keto-, Et ester, *- HCl*, 3010[2].
—, 1 - isoamyl - 4 - keto-, Et ester, *- HCl*, 3010[2].

$C_{13}H_{23}N_3O$ Hexanone, Δ^1 - cyclohexenyl-(?), semicarbazone, 3287[6].
Semicarbazone, m. 170°, of compd. from iso-BuMeCO and mesityl oxide, 3157[5].
Semicarbazone, m. 172°, of compd. from MeBuCO and mesityl oxide, 3157[5].
$C_{13}H_{24}BrNO_3$ 1,1′ - Spirobipiperidine - 4 - carboxylic acid, *N* - hydroxy-, bromide, Et ester, 385[5].
$C_{13}H_{24}Cl_2N_4O_4$ Compd., sinters 232°, decomps. 238°, from 3,6 - dihydro - 3 - methyl-6 - methylene - 2,5 - pyrazinediol, 381[7].
$C_{13}H_{24}N_2O_{11}$ *d*-Glucose, ureide, 1596[4]
$C_{13}H_{24}O$ Cyclotridecanone, 1792[5].
$C_{13}H_{24}O_2$ Cyclohexaneënanthic acid, 3160[1]
Cyclopentanecarbinol, 1,2,2,3 - tetramethyl-, propionate, 1399[2].
Δ^7 - 4 - Nonenol, 4,8 dimethyl-, acetate, 3687[1].
$C_{13}H_{24}O_3$ Acetic acid, methoxy-, menthyl ester, 43[6].
Cyclohexanepropanol, 2 - methoxy - α-methyl-, acetate, 739[5].
Cyclopentaneglyoxal, 1,2,2,3 - tetramethyl-, dimethylacetal, 1399[3].
Undecylic acid, β - keto-, Et ester, 2660[7]
$C_{13}H_{24}O_4$ Brassylic acid, 1789[2], 2937[5]
Capric acid, α-hydroxy-, Me ester, acetate, 768[2].
1,9 - Nonanedicarboxylic acid, di Me ester, 1789[2].
5,5′ - Spirobi[*m* - dioxane], 2,2 - diisopropyl-, 2109[1]
$C_{13}H_{24}O_5$ Malonic acid, ethyl(propoxymethyl), di-Et ester, 581[8].
$C_{13}H_{24}O_6$ Azelaic acid, α,η - dihydroxy-, di-Et ester, 2831[2].
Malonic acid, bis(ethoxymethyl)-, di Et ester, 581[9].
$C_{13}H_{24}O_{11}$ Maltoside, methyl-, 2315[1]
$C_{13}H_{25}NO$ Caprylic acid, piperidide, 2845[1]
$C_{13}H_{25}NOS$ Carbamic acid, dimethylthiono-, *l*-menthyl ester, 373[7].
$C_{13}H_{25}NO_2$ Cyclohexaneacetic acid, α - dimethylamino 3 - methyl, Et ester, *and HCl*, 903[9]
$C_{13}H_{25}NO_4$ Propionic acid, β,β' - isopropyliminobis-, di Et ester, 3010[2]
—, β,β' - propyliminobis-, di-Et ester, 3010[1].
$C_{13}H_{25}N_3O$ Cyclododecanone, semicarbazone, 1792[5].
$C_{13}H_{26}Br_2$ Tridecane, 1,13 dibromo, 1789[3]
$C_{13}H_{26}N_2O_4$ Alanine, *N*, *N′* - heptamethylenebis-, *and salts*, 371[1].
Alanine, *N*, *N′* - pentamethylenebis, di Me ester, *and di-HCl*, 370[9].
Isobutyric acid, *N*, *N′* - pentamethylenebis [α - amino-, *and salts*, 370[9].
$C_{13}H_{26}O$ Δ^8 - 5 - Decenol, 2,5,9 - trimethyl-, 3687[1].
$C_{13}H_{26}O_2$ Caprylic acid, α-ethyl-, Pr ester, 363[1].
$C_{13}H_{26}O_3$ Tridecoic acid, hydroxy-, 1590[8], 1599[1]
$C_{13}H_{27}NO_2$ Butyraldehyde, β - (1 - piperidyl), di-Et acetal, 1788[7].
$C_{13}H_{27}NO_4$ Glycine, *N* - (γ,γ - diethoxy - α - methylpropyl) - *N* - methyl-, Et ester, 1788[6].
$C_{13}H_{28}N_2$ Coniine, 1 - (ϵ - aminoamyl)-, 417[9].
$C_{13}H_{28}N_2O_3$ See *Crangonine*.
$C_{13}H_{28}N_2S$ Urea, dihexylthio-, 2835[4].
$C_{13}H_{28}O_2$ 1,13-Tridecanediol, 1789[1].
$C_{13}H_{28}O_2S_2$ Acetone, bis(γ - ethoxypropyl) mercaptole, 737[2]
$C_{13}H_{28}O_7$ *d*-Glucose, pentamethyl-, di-Me acetal, 2987[7].
$C_{13}H_{30}INO_2$ (γ,γ - Diethoxy - α - methylpropyl)-diethylmethylammonium iodide, 1788[8].
$C_{13}H_{30}I_2N_2$ Pyrrolidine, 1 - (ϵ - dimethylaminoamyl)-, dimethiodide, 417[9].
$C_{13}H_{31}NO$ Butyltripropylammonium hydroxide, 3747[5].
Tributylmethylammonium hydroxide, 3747[4].
$C_{14}H_5ClO_7S_2$ Anthrapurpurin, 1,2 - sulfite-, 7 chlorosulfinate, 3453[3].
$C_{14}H_5Cl_3O_4$ 1 - Xanthenecarboxylic acid, 2,3,4-trichloro - 9 - keto, *and salts*, 596[8].
$C_{14}H_5N_3O_8$ Phenanthraquinone, 2,4,7-trinitro, 1620[4].
$C_{14}H_6BaMo_2O_{12}$ Barium monogallatomolybdate, 3405[9].
$C_{14}H_6BaO_{12}W_2$ Barium monogallatotungstate, 3405[9].
$C_{14}H_6Br_2Cl_2$ Anthracene, 9,10 - dibromo - 2,3-dichloro-, 3166[8].
$C_{14}H_6Br_2N_2O_2$ 4 - *peri* - Pyrazinocarbazole - 5,6 dione, 2,10 - dibromo, 1079[8]
$C_{14}H_6Br_3NO_3$ Anthrone, 2,3,10 tribromo - 10 nitro, 192[7]
$C_{14}H_6Cd_2N_4O_{10}$ + 6H₂O, 720[7]
$C_{14}H_6Cl_2N_2O_4$ Anthracene, 1,5 dichloro 9,10 dinitro, 192[7]
$C_{14}H_6Cl_2N_2O_6$ Diphenoyl chloride, 3,5′ - dinitro 1801[1]
$C_{14}H_6Cl_2O_2$ Anthraquinone, 1,4 - dichloro, 3166[7].
$C_{14}H_6Cl_4O_4$ Benzoic acid, 2,3,4,5 tetrachloro-6 salicylyl, 596[6]
$C_{14}H_6K_2O_4$ Quinizarin, di-K deriv., 741[5].
$C_{14}H_6Li_2O_4$ Quinizarin, di-Li deriv., 741[5].
$C_{14}H_6N_2O_2$ 2,7 - Naphthalenediglyoxylonitrile, 1619[3]
$C_{14}H_6N_2O_3$ Anthracenetrione, diazo-, 757[7,9].
$C_{14}H_6N_2O_6$ Phenanthraquinone, 2,7(and 4,5)-dinitro, 1620[4]
$C_{14}H_6N_4O_{10}$ Benzil, 3,5,3′,5′ tetranitro, 1620[6]
$C_{14}H_6Na_2O_4$ Quinizarin, di-Na deriv., 741[5].
$C_{14}H_6O_6S$ Hystazarin, 2,3 - sulfite, 3453[3].
$C_{14}H_6O_7S$ Anthragallol, 2,3-sulfite, 3453[4].
Purpurin, 1,2-sulfite, 3453[3].
$C_{14}H_7BiO_5$ Alizarin, complex Bi compd., 796[4]
$C_{14}H_7BrO_2S_2$ Phthalic acid, dithiol-, (4 - bromo-*o* - phenylene) cyclic ester(?), 1797[9].
Spiro[1,3 - benzodisulfole - 2,1′ - phthalan]-2′-one, 5(or 6) - bromo-(?), 1797[9].
$C_{14}H_7Br_3N_2O$ 4 - *peri* - Pyrazinocarbazole - 5(6) one, 2,8,10 - tribromo-, 1079[8].
$C_{14}H_7ClO_3$ 1,10 Anthracenedione, 9 - chloro 4-hydroxy-, 2853[8].
Anthraquinone, chlorohydroxy-, 2853[8], 3453[1]
2 - Xanthenecarboxylyl chloride, 9 - keto, 392[3].
$C_{14}H_7Cl_2NO_2$ Anthracene, 2,3 - dichloro - 9 - nitro-, 3166[8].
$C_{14}H_7Cl_3N_2O_4$ Anthracene, 1,5,9 - trichloro 9,10 - dihydro - 9,10 - dinitro-, 192[7].
$C_{14}H_7Cl_3O$ Anthrone, 4,5,10 - trichloro-, 2492[7].
$C_{14}H_7Cl_5$ Anthracene, pentachloro-9,10-dihydro-, 754[7], 2492[8].
$C_{14}H_7NO_4$ Anthraquinone, nitro-, 2695[6].
$C_{14}H_7NO_6$ Alizarin, nitro-, 2268[7], 2606[9].
$C_{14}H_7N_3O_7S$ 9,10 - Dihydro - 9,10 - diketo 3 - nitro - 2 - anthracenediazonium sulfate, 757[8].
$C_{14}H_8BNO_3$ Anthraquinone, 1 - amino-, meta borate, 1052[7].

$C_{14}H_8BrClO$ Anthrone, 10-bromo-1-chloro-, 1078[3].
$C_{14}H_8BrN_5O_2$ 1,4-Imidazopyridin-2(3)-one, 3-{[3-bromo-2,3-dihydro-2-keto-3-(1,4-imidazopyridinyl)]imino}-(?), 2858[9].
$C_{14}H_8Br_2$ Anthracene, 9,10-dibromo-, 134[6], 192[6].
$C_{14}H_8Br_2Cl_2$ Anthracene, dibromodichlorodihydro-, 752[8], 2492[3], 3166[3].
$C_{14}H_8Br_2N_2O$ 4-*peri*-Pyrazinocarbazol-5(6)-one, 2,10-dibromo-, 1079[7].
$C_{14}H_8Br_2N_4O_4$ Benzaldehyde, 4-bromo-3-nitro-, azine, 2321[7].
$C_{14}H_8Br_2S_4$ 2,2'-Bi-1,3-benzodisulfole, 5,5'-dibromo-(?), 1797[9].
Glyoxaldibromodithiocatechol, 1797[9].
$C_{14}H_8Br_3ClN_2O$ Carbazole, 1,3,6-tribromo-8-α-chloroacetamido-, 1079[9].
$C_{14}H_8ClNO_2$ Anthracene, 1-chloro-9(or 10)-nitro-, 192[6].
Anthraquinone, 1-amino-5-chloro-, P 425[1].
$C_{14}H_8Cl_2$ Anthracene, dichloro-, 3166[3,4].
$C_{14}H_8Cl_2N_2$ Nicotinonitrile, 2,4-dichloro-6-styryl-, 915[2].
$C_{14}H_8Cl_2N_2O_4$ Anthracene, dichlorodihydrodinitro-, 192[6].
$C_{14}H_8Cl_2N_4O_4$ Benzaldehyde, 4-chloro-3-nitro-, azine, 2321[6].
$C_{14}H_8Cl_2O$ Anthrone, dichloro-, 1078[4], 2492[7], 3166[6].
$C_{14}H_8Cl_2O_2$ Anthrone, 4,5-dichloro-10-hydroxy-, 2492[8].
$C_{14}H_8Cl_2O_3$ Benzoyl chloride, oxybis-, 392[3,4].
$C_{14}H_8Cl_4$ Anthracene, tetrachloro-9,10-dihydro-, 752[9], 2492[3].
$C_{14}H_8Cl_{12}Fe_2O_{16}$ + $2H_2O$, 1769[4].
$C_{14}H_8N_2O_4$ Anthraquinone, 1-amino-2-nitro-, P 425[1].
1,2,4-Benzoxaz-4-one, 7-nitro-3-phenyl-, 2324[4].
3-Pseudoindolone, 6-nitro-2-phenyl-, *N*-oxide, 2324[4]
Tolan, 3,4'-dinitro-, 2850[8].
$C_{14}H_8N_2O_6$ Benzil, dinitro-, 2676[8,9].
$C_{14}H_8N_2O_7$ Benzoic anhydride, *p,p'*-dinitro-, 364[3].
$C_{14}H_8N_2O_8$ *m,m'*-Bibenzoic acid, 2,2'-dinitro-, 3289[1].
Diphenic acid, 3,5'-dinitro-, 1801[1].
$C_{14}H_8N_2S_2$ Benzonitrile, *o,o'*-dithiobis-, 2995[3].
1,1'-Bibenzothiazole, 600[1].
$C_{14}H_8N_4O_2$ $\Delta^{3,3'(2,3')}$-Bi-[1,4-pyrrolopyridine]-3,3'-dione, 396[7].
2,3-β-Quinoxaloquinoxaline-2,3-diol(?), 1805[7].
$C_{14}H_8N_4O_6$ Diphenic acid, 3,5'-dinitro-, hydrazide, 1801[1].
$C_{14}H_8N_4O_8$ Stilbene, 2,4,2',4'-tetranitro-(?), 2851[2].
$C_{14}H_8N_{10}O_{13}$ Guanidine, α-carbamyl-α,β(or α,γ)-dipicryl-, 1061[9].
$C_{14}H_8O_2$ See *Anthraquinone; Phenanthrenequinone.*
$C_{14}H_8O_4$ Quinizarin, 1078[3], 2853[9], 3293[1].
Xanthenecarboxylic acid, 9-keto-, *and salts*, 392[3,4].
$C_{14}H_8O_5S$ 2-Anthraquinonesulfonic acid, P 1995[9].
$C_{14}H_8O_6$ 2,7-Naphthalenediglyoxylic acid(?), 1619[4].
$C_{14}H_8O_8$ 1,4,5,8-Naphthalenetetracarboxylic acid, P 2167[6].
$C_{14}H_9BrN_2OS$ Benzothiazole, 1-benzamido-5-bromo-, 2858[2].
$C_{14}H_9BrN_2O_4$ Anthracene, 9-bromo-9,10-dihydro-9,10-dinitro-, 192[6].
$C_{14}H_9BrO$ 9-Phenanthrol, 10-bromo-, 412[5].
$C_{14}H_9Br_2ClN_2O$ Carbazole, 3,6-dibromo-1-α-chloroacetamido-, 1079[7].
$C_{14}H_9Br_2NO$ Carbazole, 9-acetyl-3,6-dibromo-, 1079[5].
$C_{14}H_9Br_3N_2O$ Carbazole, 1-acetamido-3,6,8-tribromo-, 1079[8].
$C_{14}H_9Cl$ Anthracene, chloro-, P 1631[4].
$C_{14}H_9ClN_2O_4$ Stilbene, α-chlorodinitro-, 1801[5].
$C_{14}H_9ClO$ Anthrone, 10-chloro-, 1078[4].
$C_{14}H_9ClO_2$ Anthrone, 1(and 4)-chloro-10-hydroxy-, 1078[4].
$C_{14}H_9ClO_3$ Benzaldehyde, 2-chloro-3-hydroxy-, benzoate, 1065[3].
$C_{14}H_9Cl_9O_5$ Compd., m. 211–12°, from 2,4-cresotic acid, Cl_3CCHO and H_2SO_4, 40[9].
$C_{14}H_9I_2NO$ Carbazole, 9-acetyl-3,6(?)-diiodo-, 1805[2].
$C_{14}H_9NO_2$ 5-Acridinecarboxylic acid, 1239[1].
Anthracene, nitro-, P 1631[4].
Anthraquinone, 1(and 2)-amino-, P 424[8], P 425[1,2].
Phthalimide, *N*-phenyl-, 186[6].
$C_{14}H_9NO_2S$ Benzothiazole, 1-(3,4-methylenedioxyphenyl)-, 386[7].
$C_{14}H_9NO_3$ Cinchomeronic anhydride, 2-methyl-6-phenyl-, 3296[7].
2-Xanthenecarboxamide, 9-keto-, 392[3].
$C_{14}H_9NO_5$ Salicylaldehyde, *p*-nitrobenzoate, 399[6].
$C_{14}H_9N_3$ 3-Indazolenitrile, 2-phenyl-, 1805[9].
$C_{14}H_9N_3O$ 3-Indazolenitrile, 2-phenyl-, 1-oxide, 1805[8].
$C_{14}H_9N_3O_2$ 1,2,3-Benzotriazin-4(3)-one, 3-benzoyl-, 382[1].
$C_{14}H_9N_3O_3$ Isoindazole, 1-benzoyl-4-nitro-, 1622[9].
$C_{14}H_9N_3O_4$ 2-Phenazinol, nitro-, acetate, 603[4,7].
$C_{14}H_9N_3O_6$ Benzil, 2,4-dinitro-, monoxime, 2324[4].
Stilbene, 2,4,6-trinitro-, 3000[3].
$C_{14}H_9N_3O_8$ Dipicolinic acid, 4,4'-iminobis-, 1238[7].
$C_{14}H_9N_3O_9$ Guaiacol, 4,5,6-trinitro-, benzoate, 1395[1].
$C_{14}H_9N_3O_{10}$ 2,7-Naphthalenedicarboxylic acid, trinitro-, di-Me ester, 1619[7].
$C_{14}H_9N_3S_2$ Diphenylamine, *p,p'*-dithiocyano-, 1603[9], P 2167[4].
$C_{14}H_9N_5O_4$ 1,2,3-Benzotriaz-4(3)-one, 3-*m*-nitrobenzamido-, 206[9].
$C_{14}H_9N_5S_2$ Benzothiazole, 1,?'-azobis[1'-amino-, *and* ·*HCl*, 2858[2].
$C_{14}H_{10}$ (See also *Anthracene; Phenanthrene.*)
Hydrocarbon, m. 124°, from cholesterol, 1241[9].
$C_{14}H_{10}Br_2N_2O$ Benzoic acid, *m*-bromo-, *m*-bromobenzalhydrazide, 2672[3].
Carbazole, 1-acetamido-3,6-dibromo-, 1079[7].
$C_{14}H_{10}Br_2N_2O_4$ Bibenzyl, α,α'-dibromo-3,4'-dinitro-, 2850[9].
$C_{14}H_{10}Br_4N_2OS$ Benzothiazole, 1-benzamido-, tetrabromide, 2858[2].
$C_{14}H_{10}ClN_3O_3$ Benzaldehyde, 2-chloro-5-nitro-, benzoylhydrazone, 1622[9].
$C_{14}H_{10}ClN_3O_4Se$ 1-(*p*-Hydroxyphenyl)-4-nitropiaselenolium chloride, acetate, 2498[7].

$C_{14}H_{10}Cl_2N_2O_3$ *m* - Benzotoluide, 2,4 - dichloro-6-nitro-, 2834[2].
$C_{14}H_{10}Cl_2N_2O_4$ Bibenzyl, α,α′ - dichloro - 3,4′-dinitro-, 1801[6].
$C_{14}H_{10}Cl_2O_2$ 9,10 - Anthradiol, 1,4 - dichloro - 9,10-dihydro-, 3166[4].
$C_{14}H_{10}Cl_2O_{10}S_4$ Toluenesulfonic acid, 5 - (chlorosulfonyl) - 2 - hydroxy-, sulfonylide (bimol.), 1395[7].
$C_{14}H_{10}Cl_3NO$ Acetanilide, 2,6 - dichloro - 4 - (*p* - chlorophenyl)-, 1800[9].
$C_{14}H_{10}CoO_4$ Salicylaldehyde, Co deriv., 399[3].
$C_{14}H_{10}CuO_4$ Salicylaldehyde, Cu deriv., 399[4].
$C_{14}H_{10}FeO_4$ Salicylaldehyde, Fe deriv., 399[5].
$C_{14}H_{10}FeO_6$ Salicylic acid, Fe deriv., 399[4].
$C_{14}H_{10}HgN_2O_3$ Benzoic acid, *o*(and *p*) - (3-hydroxymercuri - 2,5 - cresylazo)-, 2′,3′-anhydride, 1605[6].
$C_{14}H_{10}HgO_4$ Benzoic acid, *p,p*′ - mercuribis-, *and di-Na salt*, 1063[3].
$C_{14}H_{10}HgO_4S_2$ Benzoic acid, *o,o*′ - mercuridithiobis-, *and salts*, 183[6,7].
$C_{14}H_{10}MgO_4$ Salicylaldehyde, Mg deriv., 399[3].
$C_{14}H_{10}N_2O$ 7 - Imidazobenzisoquinolinone, 9,10-dihydro-, 1075[4].
$C_{14}H_{10}N_2OS$ 2 - Benzisothiazolecarboxanilide, 763[8].
$C_{14}H_{10}N_2O_2$ Anthraquinone, diamino-, P 425[1,2], P 2417[5].
2 - Benzimidazolol, benzoate, 381[9].
Cinchomeronimide, 2 - methyl - 6 - phenyl-, 3296[7].
Diphenic acid, cyclic hydrazide, 2672[5].
3 - Indazolecarboxylic acid, 2 - phenyl, 1806[3].
$C_{14}H_{10}N_2O_3$ Anthraquinone, 2 - hydrazino-3-hydroxy-, 757[8].
$C_{14}H_{10}N_2O_4$ Benzaldehyde, nitro-, oxime, Bz deriv., 179[3].
Stilbene, dinitro-, 1801[2], 2844[9], 3001[9].
$C_{14}H_{10}N_2O_5$ Acetophenone, nitro(nitrophenyl), 1801[1].
$C_{14}H_{10}N_2O_6S_2$ Acetic acid, [*m* - (2,4 - dinitrophenylmercapto)phenylmercapto], 3163[3]
$C_{14}H_{10}N_2O_8$ 2,7 - Naphthalenedicarboxylic acid, dinitro-, di-Me ester, 1619[6]
$C_{14}H_{10}N_4O$ 3(2) - *s* - Tetrazinone, 2,6 - diphenyl, 1084[8].
$C_{14}H_{10}N_4O_2$ 1,2,3 - Benzotriaz - 4(3) - one, 3-benzamido-, 206[7].
2,2′ - Bi - [1,4 - pyrrolopyridine] - 3,3′-diol, *and di-HCl*, 396[9].
Diphenic acid, 3,5,3′,5′ - tetraamino-, dilactam, *and sulfate*, 1620[5].
$C_{14}H_{10}N_4O_3$ 4(3) - Quinazolone, 3 - amino - 2-(*m*-nitrophenyl)-, 206[8].
$C_{14}H_{10}N_4O_6$ Diphenamide, 3,5′ - dinitro-, 1801[1]
$C_{14}H_{10}N_4O_8S$ Sulfide, bis(2,6 - dinitro - *m* - tolyl), 1062[8].
$C_{14}H_{10}N_4O_8S_2$ Disulfide, bis(4,6 - dinitro - *m* - tolyl), 1062[4].
$C_{14}H_{10}N_4O_{10}$ 4,4′ - Bi - *m* - cresol, 2,6,2′,6′-tetranitro-, 187[4].
$C_{14}H_{10}N_4S_4$ 5,5′ - Bibenzimidazole - 2,2′(3,3′)-dione, 2,2′ - dithio-, 914[7].
$C_{14}H_{10}N_{10}$ 1,2,3,5 - Tetrazole, 4,4′ - azobis[1-phenyl-, 764[1].
$C_{14}H_{10}O$ Phenanthrol, 134[6].
$C_{14}H_{10}O_2$ Benzil, 190[1], 327[1], 2491[6], 3164[1], 3292[9].
1,4 - α - Naphthopyrone, 2 - methyl-, 1237[1].
9,10 - Phenanthrenediol, 1403[6].
Phthalide, phenyl-, 751[4].
$C_{14}H_{10}O_2S_2$ Benzoyl disulfide, 2161[6].
$C_{14}H_{10}O_3$ Benzoic anhydride, 181[4].
$C_{14}H_{10}O_4$ See *Benzoyl peroxide*.
$C_{14}H_{10}O_4Zn$ Salicylaldehyde, Zn deriv., 399[4].
$C_{14}H_{10}O_5$ Benzoic acid, oxybis-, *and salts*, 392[2,3].
Gentianin, 645[2].
Salicylosalicylic acid, P 2564[2].
$C_{14}H_{10}O_6$ Benzoic acid, 2,3,4 - trihydroxy-, 4 - benzoate, 2489[1].
Gallic acid, monobenzoate, 1987[1].
$C_{14}H_{10}O_6S_2$ Salicylic acid, 5,5′ - dithiobis-, 182[8].
$C_{14}H_{10}O_7$ β - Resorcylic acid, 4 - β - resorcylate, 2488[9].
$C_{14}H_{10}O_7U$ Uranium salicylate (basic), 3139[7].
$C_{14}H_{10}O_9$ Digallic acid, 1967[4].
$C_{14}H_{11}BrN_4O$ 3(2) - *s* - Tetrazinone, 4 - (*p*-bromophenyl) - 1,4 - dihydro - 6 - phenyl-, 1084[8].
$C_{14}H_{11}Br_2NO$ Acetanilide, 2 - bromo - 4 - (*p* - bromophenyl)-, 1800[9].
—, 2,6 - dibromo - 4 - phenyl-, 1800[9].
$C_{14}H_{11}Br_3N_2O$ Acetophenone, dibromo - *p*-hydroxy-, *p* - bromophenylhydrazone, 598[7].
$C_{14}H_{11}ClN_2O$ Benzaldehyde, *o* - chloro-, benzoylhydrazone, 1622[9].
$C_{14}H_{11}ClN_2O_3$ Acetamide, *N* - (5 - chloro - 2 - nitrophenyl) - *N* phenyl, 2834[6].
$C_{14}H_{11}ClO_2$ Acetophenone, 5 - chloro - 2 - hydroxy - α - phenyl-, 1237[7].
m-Cresol, chloro-, benzoate, 2842[1,2].
$C_{14}H_{11}ClO_4$ 2 - Naphthoyl chloride, 3 - carboxyoxy-, Et ester, 1616[4].
$C_{14}H_{11}Cl_2N_3O_3$ Benzaldehyde, 2,4(and 2,6)-dichloro - 3 - methoxy-, *p* - nitrophenylhydrazone, 1065[6].
$C_{14}H_{11}Cl_2N_3O_5$ Hydroxylamine, β,β - bis(2-chloro - 5 - nitrobenzyl)-, 1230[4].
$C_{14}H_{11}Cl_3OTe$ α - Phenylphenacyltellurium trichloride, 414[1].
$C_{14}H_{11}CuNO_2$ Benzoin, oxime, Cu deriv., 1055[6].
$C_{14}H_{11}IO_2$ *p*-Cresol, 3-iodo-, benzoate, 401[1].
$C_{14}H_{11}I_2N$ Carbazole, 9 - ethyl - 3,6 - diiodo, 1805[2].
$C_{14}H_{11}N$ Acridine, 5 - methyl-, 1239[1].
6,7 - Benzoquinoline, 2 - methyl-, *and -HCl*, 1628[1].
$C_{14}H_{11}NO$ Indole, 2 - (*p* - hydroxyphenyl)-, 598[6].
Phthalimidine, 2-phenyl-, 1803[2].
Tolunitrile, α - phenoxy-, 391[6,7].
$C_{14}H_{11}NOS$ 2(1) - Benzisothiazolone, 1 - *o* - tolyl-, 2327[7].
Dibenzothiophene, acetamido-, 2155[3].
$C_{14}H_{11}NO_2$ Benzil, monoxime, 752[8].
9 - Fluorenecarbamic acid, 188[9].
Phthalimidine, 2 - (*p* - hydroxyphenyl)-, 1803[2].
$C_{14}H_{11}NO_2S$ Benzothiazole, 1 - (4 hydroxy - *m* - anisyl), 386[7].
2 - α - Naphthisothiazolecarboxylic acid, Et ester, *and AgNO₃ compd.*, 763[7].
$C_{14}H_{11}NO_3$ Benzohydroxamic acid, benzoate, 2161[6].
4 - Pyridinepyruvic acid, β - phenyl-, 187[9].
$C_{14}H_{11}NO_4$ Benzophenone, 2 - methoxy - 5 nitro-, 1230[1].
$C_{14}H_{11}NO_5$ Anthranilic acid, *N* - 2,3,4 - trihydroxybenzal-, 1987[1].
$C_{14}H_{11}N_2NaO_4S_2$ Benzisosulfonazole, 2 - *o* sulfamylbenzal-, sodium deriv., 2450[9].
$C_{14}H_{11}N_3O$ 3 - Indazolecarboxamide, 2 - phenyl-, 1806[3].

1(2)-Phthalazone, 2-(p-aminophenyl)-, 1803[2].
4(3)-Quinazolone, 3-amino-2-phenyl-, 206[7].
Triazolol, diphenyl-, 914[9].

$C_{14}H_{11}N_3OS$ 1,2,4-Benzotriazine-3-mercaptan, 1,2-dihydro-, benzoate, 745[7].

$C_{14}H_{11}N_3O_2$ 2-Phenazinol, acetamido-, 603[6,7].
—, 8-amino-, acetate, 603[5].
α-Tolunitrile, α-anilino-o-nitro-, 1805[7].

$C_{14}H_{11}N_3O_3$ 4-Phenanthridinecarboxylic acid, 2,7-diamino-9,10-dihydro-9-keto-, ·H_2SO_4, 1620[6].

$C_{14}H_{11}N_3O_4$ Dipicolinic acid, 4-(benzalhydrazino)-, 1807[3].
2-Phenazinol, 5,10-dihydronitro-, acetate, 603[4,7].

$C_{14}H_{11}N_3O_5$ Acetamide, N,N-bis(p-nitrophenyl)-, 2834[6].

$C_{14}H_{11}N_3O_6$ Hydroxylamine, β-(4,6-dinitro-o-tolyl)-, Bz deriv., 2666[9].

$C_{14}H_{11}N_3O_7$ Hydroxylamine, β-(4,6-dinitro-m-anisyl)-, benzoate, 2667[4].
—, β-(2,4-dinitro-5-phenoxyphenyl)-, acetate, 2667[6].

$C_{14}H_{11}N_5$ 1,2,3,5-Tetrazole, 4-benzalamino-1-phenyl-, 704[1].

$C_{14}H_{11}N_5O_6$ Acetophenone, 2,4,6-trinitro-, phenylhydrazone, 376[1].

$C_{14}H_{11}N_7O_8$ 1,2,4-Oxdiazole, 3(or 5)-amino-5(or 3)-anilino-, picrate, 2161[7].

$C_{14}H_{11}NaO_4$ Salicylaldehyde, Na deriv., salicylaldehyde addn. compd., 741[3].

$C_{14}H_{12}$ Ethylene, as-diphenyl-, 2671[6], 3292[7], 3451[6].
Stilbene, 1953[2], 2834[9], 2997[2,3].

$C_{14}H_{12}AsCl_2NO$ Arsine, dichloro(p-N-phenylacetamidophenyl), 1606[6].

$C_{14}H_{12}AsN_3O_8$ Arsanilic acid, 3-nitro-N-(3-nitro-p-toluyl)-, 391[2].

$C_{14}H_{12}BrClN_2O$ Benzaldehyde, chloromethoxy-, p-bromophenylhydrazone, 1065[5].

$C_{14}H_{12}BrN_3O_4$ Salicylaldehyde, 3-bromo-5-methoxy-, p-nitrophenylhydrazone, 178[9].

$C_{14}H_{12}Br_4N_2O_2$ o-Cresol, α,α'-hydrazobis[4,6-dibromo-, 1810[7].

$C_{14}H_{12}ClNO$ Acetanilide, chlorophenyl-, 1800[8], 2848[2,3].

$C_{14}H_{12}ClNO_2$ o-Benzaniside, 5'-chloro-, 3694[6].

$C_{14}H_{12}ClN_3O_3$ Benzaldehyde, chloromethoxy-, p-nitrophenylhydrazone, 1065[5].

$C_{14}H_{12}Cl_2N_2O_2$ $\Delta^{4,4'}$-Bi-p-benzenimine, N,N'-dichloro-2,2'-dimethoxy-, 1552[4].

$C_{14}H_{12}Cl_2O_2S_2$ Anisole, 2,2'-dithiobis[4-chloro-, 398[7].

$C_{14}H_{12}Cl_2O_4S_2$ Disulfoxide, bis(5-chloro-o-anisyl), 398[7].

$C_{14}H_{12}HgN_2O_4$ Toluene, 4,4'-mercuribis[2-nitro-, 1794[1].

$C_{14}H_{12}HgO_2S$ Sulfide, p-acetoxymercuriphenyl phenyl, 1805[7].

$C_{14}H_{12}Hg_2N_2O_4S_2 + 2H_2O$ Benzoic acid, o,o'-mercuridithiobis-, mercuri-amine salt, 183[4].

$C_{14}H_{12}NNaO_5$ o-Cresol, 6-nitro-, Na deriv., salicylaldehyde addn. compd., 741[4].

$C_{14}H_{12}N_2$ Benzaldehyde, azine, 2309[8].
Indazole, 3-p-tolyl-, 2496[1].
m,p'-Tolandiamine, 2850[9].

$C_{14}H_{12}N_2O$ Indazole, 3-p-anisyl-, 2496[1].
Indazolol, p-tolyl-, 2496[1,4].
Phthalimidine, 2-(p-aminophenyl)-, 1803[2].

$C_{14}H_{12}N_2OS$ Methylene violet, 1240[2].

$C_{14}H_{12}N_2O_2$ Benzaldehyde, p-(p-anisylazo)-, 2836[5].
Glyoxime, diphenyl-, 42[1], 752[6].
Glyoxylanilide, phenyl-, oxime, 360[4], 1804[8].
Indazolol, p-anisyl-, 2496[1,6].

$C_{14}H_{12}N_2O_2S$ Indazole, tolylsulfonyl-, 762[7], 763[1].
o-Toluenesulfonamide, N-(o-cyanophenyl)-, 762[9].

$C_{14}H_{12}N_2O_2S_2$ m,m'-Bitolyl, 6,6'-bis(nitrosomercapto)-, 2975[9].

$C_{14}H_{12}N_2O_3$ Acetamide, N-(p-nitrophenyl)-N-phenyl-, 2834[6].
Benzamide, oxybis-, 392[2,4].
Cinchomeron-4-amic acid, 2-methyl-6-phenyl-, 3296[7].
Diphenic acid, monohydrazide, 2672[5].
4-Pyridinepyruvic acid, β-phenyl-, oxime, ·*HCl*, 187[9].

$C_{14}H_{12}N_2O_4$ Benzanilide, 2-methoxy-5-nitro-, 1230[1].
Benzophenone, 2-methoxy-5-nitro-, 1230[1].
p,p'-Bitolyl, dinitro-, 1614[8].
Mandelic acid, m-(hydroxyphenylazo)-, 2992[9].

$C_{14}H_{12}N_2O_4S_2$ Benzisosulfonazole, 2-o-sulfamylbenzal-, 3450[6].
Disulfide, bis(2-nitro-p-tolyl), 2327[5].

$C_{14}H_{12}N_2O_5$ Ethanol, 1-(m-nitrophenyl)-2-(p-nitrophenyl)-, 1801[4].

$C_{14}H_{12}N_2O_6$ Ether, nitroanisyl nitrobenzyl, 1608[5,6].
1-Naphthaleneacetic acid, 2,4-dinitro-, Et ester, 2325[3].

$C_{14}H_{12}N_2O_6S_2$ Anisole, 3,3'-dithiobis[nitro-, 1796[5,6].

$C_{14}H_{12}N_2S$ Benzothiazole, 1-(p-aminophenyl)-4-methyl-, 2327[5].

$C_{14}H_{12}N_4$ s-Tetrazine, 2,3-dihydro-2,6-diphenyl-, 1084[8].

$C_{14}H_{12}N_4O$ 3(2)-s-Tetrazinone, 1,4-dihydro-4,6-diphenyl-, 1084[7].

$C_{14}H_{12}N_4O_4$ 2,6-Lutidine-3-carboxylic acid, 4-(nitrophenylazo)-(?), 1808[6].

$C_{14}H_{12}N_4O_5$ Acetanilide, 5-anilino-2,4-dinitro-, 590[8].

$C_{14}H_{12}N_4O_6$ Salicylaldehyde, 5-methoxy-3-nitro-, p-nitrophenylhydrazone, 178[8].

$C_{14}H_{12}N_4S$ 1,3,4-Thiodiazole, 2,5-dianilino-, 2162[2].

$C_{14}H_{12}N_6S_2$ 1,2,4-Benzotriazine, 3,3'-thiobis[1,2-dihydro-, 745[7].

$C_{14}H_{12}N_{10}$ 1,2,3,5-Tetrazole, 4,4'-hydrazobis[1-phenyl-, 763[8].

$C_{14}H_{12}O$ Acetaldehyde, diphenyl-, 2844[6], 3000[2].
Desoxybenzoin, 2158[8], 2844[7].
Ethylene oxide, α,β-diphenyl-, 2850[4].

$C_{14}H_{12}O_2$ (See also *Benzoin*.)
Acetic acid, diphenyl-, 187[7].
Anthraquinone, 1,2,3,4-tetrahydro-, 1404[8].
Benzoic acid, benzyl ester, 178[7].
9,10-Phenanthrenediol, 9,10-dihydro-, 1404[7].
Phenanthrenequinone, 1,2,3,4-tetrahydro-, 1404[4].
Xanthydrol, 9-methyl-, *perchlorate*, 2328[4].

$C_{14}H_{12}O_3$ 2-Acetonaphthone, 3-hydroxy-, acetate, 1616[9].
Acetophenone, 2,4-dihydroxy-α-phenyl-, 2320[8].
Benzilic acid, 187[9], 375[1], 2491[7], 3712[8]; *Ag salt*, 409[5].

Benzoic acid, *o*-(*p*-toloxy)-, *Ag salt*, 392[2].
Benzophenone, 3,4 - dihydroxy - 2′ - methyl-, 402[3].
1,3 - Butanedione, 1 - (hydroxynaphthyl)-, 1237[1,2].
Salicylic acid, benzyl ester, 1030[2].
o - Toluic acid, *α* - hydroxy - *α* - phenyl-, 1226[6].

$C_{14}H_{12}O_3Se$ Selenophene, 3 - *o* - carboxybenzoyl-2,5-dimethyl-, 592[3].

$C_{14}H_{12}O_4$ 2 - Acetonaphthone, 1,8 - dihydroxy-, 8-acetate, 1053[1].
Cotoin, 1030[6].
2,7 - Naphthalenedicarboxylic acid, di-Me ester, 1619[1].
2 - Naphthaleneglyoxylic acid, 1 - hydroxy-, Et ester, 593[9].

$C_{14}H_{12}O_4S$ Salicylaldehyde, *p* - toluenesulfonate, 2816[2].

$C_{14}H_{12}O_4S_4$ 2,6 - Thianthrenediol, 3,7 - dimethoxy-, 9,10-disulfide, 2681[8].

$C_{14}H_{12}O_5$ Chromone, 3 - acetyl - 6 - hydroxy 2-methyl-, acetate, 1237[6].
2 - Naphthoic acid, 3 - carbethoxyoxy-, 1616[4].

$C_{14}H_{12}O_{12}S_4$ *m* - Benzenedisulfonic acid, 4 - hydroxy - 5 - methyl-, sulfonylide (bimol.), *and Ba salt*, 1395[7].

$C_{14}H_{12}S_2$ 1,3 - Benzodisulfole, 2 - methyl - 2 - phenyl-, 3290[2].

$C_{14}H_{13}AsClN$ Phenarsazine, 1 - chloro - 1,6-dihydro - 3,9 - dimethyl-, 1607[1].

$C_{14}H_{13}AsClNO_2$ Phenarsazine, 1 - chloro - 1,6-dihydro-, AcOH addn. compd., 1606[8].

$C_{14}H_{13}AsN_2O_6$ Arsanilic acid, *N* - (3 - nitro - *p*-toluyl)-, 394[1].
Phthalamic acid, *N* - (2 - amino - 4 - arsonophenyl)-, 1606[2].

$C_{14}H_{13}AsN_2O_7$ Arsanilic acid, *N* - 3 - nitroanisoyl-, 394[2].

$C_{14}H_{13}AsN_2O_8$ *m* - Arsanilic acid, 4 - hydroxy-*N* - (3 - nitroanisoyl)-, *and Na salt*, 2318[6].

$C_{14}H_{13}BrO$ 9 - Anthrol, bromo - 1,2,3,4 - tetrahydro-, 1404[1].
Ether, *p* - (bromomethyl)benzyl phenyl, 391[6].

$C_{14}H_{13}Cl$ Bibenzyl, *α*-chloro-, 577[3,4].

$C_{14}H_{13}ClN_4O_7$ Benzylamine, (chloromethyl)-, picrate, 391[7,8,9].

$C_{14}H_{13}ClO_3S$ *p* - Toluenesulfonic acid, 4 (and 6) - chloro - *m* - tolyl esters, 2842[1,2].

$C_{14}H_{13}IN_2$ 1,4 - Imidazopyridine, 2 - phenyl, methiodide, 3009[9].

$C_{14}H_{13}MoNO_3$, 3656[9].

$C_{14}H_{13}N$ Benzylamine, *N* - benzal-, *HgCl₂ addn. compd.*, 1610[8].
Carbazole, 3,6 - dimethyl-, 2831[4].

$C_{14}H_{13}NO$ Acetamide, diphenyl-, 590[7], 2097[4].
Benzophenone, *p* - methyl-, oxime, 1615[1].
Desoxybenzoin, oxime, 2158[8]

$C_{14}H_{13}NOS$ Benzoic acid, *p*-methylaminothiono-, Ph ester, 371[6].

$C_{14}H_{13}NO_2$ Acetanilide, *p* - (*p* - hydroxyphenyl)-, 1073[3].
9 - Anthrol, 1,2,3,4 - tetrahydronitroso-, 1404[2].
Benzanilide, *o*′ - (hydroxymethyl)-, 1073[8].
Benzophenone, *p* - methoxy-, oxime, 1615[1].
p, *p*′ - Bitolyl, nitro-, 1614[8].

$C_{14}H_{13}NO_3$ Acetanilide, *N* - (8 - hydroxy - 1-naphthyl)-, acetate, 1073[9].

$C_{14}H_{13}NO_4$ Carbanilic acid, carboxymethyl, ethyl ester, *Na salt*, 3164[8].

Ether, anisyl nitrobenzyl, 1608[6,8].
Ether, benzyl 4(and 5) - nitro - *o* - anisyl, 1608[8].
2 - Naphthamide, 3 - carboxyoxy-, Et ester, 1616[4].

$C_{14}H_{13}NO_5$ Propionic acid, *α* - (nitronaphthoxy)-, Me ester, 1617[8].

$C_{14}H_{13}NO_5S$ Benzoic acid, 4 - hydroxy - 3 - *p*-tolylsulfonamido-, 2839[1].

$C_{14}H_{13}NO_6S$ *p* - Toluenesulfonic acid, 3 - (2,3,4-trihydroxybenzalamino)-, 1987[1].

$C_{14}H_{13}N_3O$ Benzaldehyde, 4 - phenylsemicarbazone, 914[9].
2,1,3 - Benzotriazole, 5 - methyl - 2 - *p*-tolyl-, 2-oxide, 2836[2].

$C_{14}H_{13}N_3O_2$ Aniline, *N* - (*α* - anilinoethylidene)-*p*-nitro-, 1799[4].
Anthranilic acid, *β* - benzoylhydrazide, 206[7].
2,6 - Lutidine - 3 - carboxylic acid, 4 - phenyl azo-,-*HNO₃*, 1808[6].

$C_{14}H_{13}N_3O_4$-Toluidine, benzyldinitro-, 3448[4].
o - Vanillin, *p* - nitrophenylhydrazone, 1065[9].
Xenylamine, *N*, *N* - dimethyl - 2,4′ - dinitro-, 586[9].

$C_{14}H_{13}N_3O_5$ 3,4 - Pyrazoledicarboxylic acid, 1-(*p* - acetamidophenyl) - 5 - methyl-, *and di- K salt*, 598[9].

$C_{14}H_{13}N_3O_6$ *m* - Cresol, 5 - anilino - 4 - methoxy-2,6-dinitro, 1394[7].

$C_{14}H_{13}N_5O_9$ *s* - Collidine, 3 - nitro, picrate, 2329[1].

$C_{14}H_{14}$ *o*, *p*′-Bitolyl, 1958[2].

$C_{14}H_{14}AlK_2NO_{12}$ Aluminum dipotassium phenethylamine oxalate, 766[8].

$C_{14}H_{14}AsIO$ 6,6 - Dimethylphenoxarsonium iodide, 2839[4].

$C_{14}H_{14}AsNO_2$ Phenazarsinic acid, 3,9 - dimethyl, *and salt*, 1607[1].

$C_{14}H_{14}AsNO_4$ Arsanilic acid, *N* - acetyl *N*-phenyl, 1606[8].
--, *N* - *α* - toluyl-, 1605[8].

$C_{14}H_{14}As_2N_2Na_2O_8S_2$ See *Sulfarsphenamine*.

$C_{14}H_{14}BeO_6S_2$ + 4H₂O Beryllium *p* toluenesulfonate, 3141[6].

$C_{14}H_{14}BrNO_2$ 1 - Propanol, 2 - bromo-, 1 - naphthalenecarbamate, 1232[9].

$C_{14}H_{14}BrNO_2S$ Benzenesulfonamide, *p* - bromo-*N*-methylbenzyl, 371[9], 372[1].
--, *p*-bromo-*N* phenethyl-, 372[1].

$C_{14}H_{14}Br_2O_2Te$ Di - *p* - anisyltellurium dibromide, 2670[1].

$C_{14}H_{14}Br_4O_4$ *β* - Cumidic acid, *α*,*α*,*α*′,*α*′ - tetrabromo, di-Et ester, 350[1].

$C_{14}H_{14}ClHg_3NO_7$ Acetanilide, 2,4,6 - tris(acetoxymercuri) - 3 - chloro, 2838[2].

$C_{14}H_{14}ClNO_2$ 1 - Propanol, 3 - chloro-, 1 - naphthalenecarbamate, 1232[9].

$C_{14}H_{14}ClN_3O_2$ 2,6 - Lutidine - 3 - carboxylic acid, 4 - [*β* - (*p* - chlorophenyl)hydrazino], *HCl*, 1808[7].

$C_{14}H_{14}Cl_2O_2Te$ Di - *p* - anisyltellurium dichloride, 2670[1]

$C_{14}H_{14}Hg$ Mercury dibenzyl, 177[3].
Mercury di-*p*-tolyl, 176[9], 177[2].

$C_{14}H_{14}N_2$ Acetamidine, *N*, *N*′ - diphenyl-, 1799[4].
m, *p*′-Stilbenediamine, 2850[9].

$C_{14}H_{14}N_2O$ Acetophenone, *p* - amino - *α* - (*m*-acetamidophenyl)-, 2851[1].
Toluene, azoxybis-, 174[6].

$C_{14}H_{14}N_2O_2$ Acetone, oxime, 1 - naphthalene carbamyl deriv., 2310[6].

o - Cresol, 6 - *m* - tolylazoxy-, 174^{9}.
Ketone, 2 - *p* - anisyl - 4 - methyl - 5 - pyrimidyl methyl, 206^{6}.
Xenylamine, *N*, *N* - dimethyl - 4′ - nitro-, 586^{9}.

$C_{14}H_{14}N_2O_3$ Anisole, azoxybis-, 174^{9}, 329^{1}, 1024^{3}.
Naphthalamic acid, *N* - (*β* - aminoethyl)-, *and Pb salt*, 1075^{4}.

$C_{14}H_{14}N_2O_3S$ Indazole, *o* - toluenesulfonate, 763^{1}.
Toluenesulfonamide, *N* - (*o* - formylphenyl)-, oxime, 762^{8,9}.

$C_{14}H_{14}N_2O_4$ Barbituric acid, 5 - ethyl - 5 - phenacyl-, 3691^{3}.
3 - Hydantoinacetic acid, 5 - benzal - 1-methyl-, Me ester, 367^{1}.
5 - Pyrimidinecarboxylic acid, 2 - *p* - anisyl-1,4 - dihydro - 4 - keto-, Et ester, 206^{6}.

$C_{14}H_{14}N_2O_4S$ Toluenesulfonic acid, aminobenzamido-, 3448^{3}.

$C_{14}H_{14}N_2O_5$ 3 - Hydantoinacetic acid, 5 - anisal-, Me ester, 367^{1}.
—, 5 anisal - *α* - methyl-, *and K salt*, 366^{6}.

$C_{14}H_{14}N_2O_6$ Glyoxylohydroxamic acid, phenyl-, oxime, tri-Ac deriv., 2822^{7}.
1,4 - Phthalazinedione, 2,3 - bis(carboxyoxy) - 2,3 - dihydro-, di-Et ester, 382^{1}.

$C_{14}H_{14}N_4$ *s* - Tetrazine, 1,2,3,4 - tetrahydro - 4,6-diphenyl-, 1084^{8}.

$C_{14}H_{14}N_4O_2$ Diphenic acid, dihydrazide, 2672^{5}.

$C_{14}H_{14}N_4O_4S$ Hydantoin, 1 - [*N* - (*N* - benzoylglycyl)glycyl]-2-thio-, 3299^{1}.

$C_{14}H_{14}N_4O_5$ Theobromine salicylate, 1030^{2}.

$C_{14}H_{14}N_4O_6S$ *m* - Toluenesulfonic acid, 4 - nitro-, *β* - (nitrotolyl)hydrazide, 1794^{2}.

$C_{14}H_{14}N_6O_2S$ Benzenesulfonyl azide, *p* - (dimethylaminophenylazo)-, 1409^{8}.

$C_{14}H_{14}O$ 9 Anthrol, 1,2,3,4-tetrahydro-, 1402^{9}.
Benzyl ether, 748^{6}, 1985^{4}.
o Cresol, 6-benzyl-, 748^{7}.
Ether, benzyl tolyl, 391^{5}, 748^{4}, 3695^{4}.
—, phenethyl phenyl, 748^{8}.
Phenethyl alcohol, *α*-phenyl-, 577^{5}.
Toluylene hydrate, 42^{1}.

$C_{14}H_{14}O_2$ 1-Acetonaphthone, 2-ethoxy-, 1617^{4}.
9,10-Anthradiol, 1,2,3,4-tetrahydro-, 1404^{8}.
Anthraquinone, 1,2,3,4,5,8 - hexahydro-, 1404^{6}.
Benzene, 1-benzyloxy-3-methoxy-, 382^{6}.
Benzyl alcohol, *p* phenoxymethyl-, 391^{6}.
Bicresol, 400^{9}, 401^{1,2}, 2832^{8}, 2833^{1}.
3(4) - Dibenzofuranone, 4$_1$,9$_1$-dihydro-6$_1$,9$_1$-dimethyl-(?), 400^{8}.
Resorcinol, 4-phenethyl-, 1230^{8}, 2320^{3}, P 3332^{8}.

$C_{14}H_{14}O_2Te$ Telluride, bis(anisyl), 2315^{8}, 2670^{1}.

$C_{14}H_{14}O_2Te_2$ Ditelluride, bis(*p*-anisyl), 2669^{8}.

$C_{14}H_{14}O_3$ Chromone, 3-acetyl-2,5,7-trimethyl-, 1237^{1}.
—, 2,6-dimethyl-3-propionyl-, 1238^{2}.
Mandelic acid, C_6H_6 addn. compd., 908^{7}.
Phloroglucinol, 2-phenethyl-, 1225^{8}.

$C_{14}H_{14}O_3S$ Ethanesulfonic acid, 1,2-diphenyl-, *Ba salt*, 577^{9}.

$C_{14}H_{14}O_4$ Chromone, 7-hydroxy-2,3-dimethyl-, propionate, 1624^{7}.
—, 7 - hydroxy-2,3-dimethyl-8 propionyl-, 1624^{7}.

$C_{14}H_{14}O_4S$ *m*-Tolyl sulfate, 1395^{4}.

$C_{14}H_{14}O_4Te_2$ Guaiacol, 5,5′-ditellurobis-, 907^{9}.

$C_{14}H_{14}O_5$ 1,2 - Benzopyran-3-carboxylic acid, 6,8$_1$-dihydro - 2,6 - diketo-5,7,8-trimethyl-, Me ester, 2320^{7}.
—, 2 - keto - 6 - methoxy - 5,7,8 - trimethyl-, 2320^{7}.

$C_{14}H_{14}O_6$ Addn. compd., m. 127°, of oxalic acid and PhOH, 47^{1}.

$C_{14}H_{14}O_7$ Phloroacetophenone, triacetate, 376^{1}.

$C_{14}H_{14}O_8$ 1,2,3,4 - Benzenetetracarboxylic acid, tetra-Me ester, 1406^{3}.
1,2,3,4 - Benzenetetrol (?), tetraacetate, 3695^{2}.

$C_{14}H_{14}O_{10}$ Acetophenone, tris(carboxyoxy)-, tri-Me ester, 375^{7}.

$C_{14}H_{14}S$ Phenethyl mercaptan, *α*-phenyl-, 577^{8}.

$C_{14}H_{15}As$ Arsine, methylphenyl-*p*-tolyl-, 393^{3}.

$C_{14}H_{15}AsBrI$ (*p* - Bromophenyl)dimethylphenylarsonium iodide, 393^{4}.

$C_{14}H_{15}AsBrNO_2$ Arsinic acid, (*o*-bromophenyl)(*o*-dimethylaminophenyl)-, 1606^{4}.

$C_{14}H_{15}AsN_2O_4$ Arsanilic acid, *N*-(3-amino-*p*-toluyl)-, *and salts*, 394^{2}.

$C_{14}H_{15}AsN_2O_5$ Arsanilic acid, *N*-(3-aminoanisoyl)-, *and salts*, 394^{3}.

$C_{14}H_{15}AsN_2O_6$ Arsanilic acid, *N*-(3-aminoanisoyl)-hydroxy-, *and salts*, 2318^{6,7}.

$C_{14}H_{15}AsN_2O_7S$ Arsanilic acid, *N*-methyl-*N*-(3-nitro-*p*-tolylsulfonyl)-, 2838^{6}.

$C_{14}H_{15}BrPb$ Plumbane, bromoethyldiphenyl-, 2669^{1}.

$C_{14}H_{15}Cl_2N_3$ + H_2O See *Acriflavine*.

$C_{14}H_{15}N$ Acridine, 1,2,3,4-tetrahydro-2(or 4)-methyl-, 1628^{6}.
Benzohydrylamine, *p*-methyl-, *and -HCl*, 1615^{1}.
Benzoquinoline, tetrahydromethyl-, *and salts*, 1627^{9}, 1628^{1}.
Dibenzylamine, 1223^{2}, 1603^{4}.
Phenethylamine, *α* phenyl-, 1400^{6}; *-HCl*, 2158^{8}.
Toluidine, *N*-benzyl-, 2155^{8}.

$C_{14}H_{15}NO$ 9-Anthrol, 10-amino-1,2,3,4-tetrahydro-, 1404^{2}.
Benzohydrol, *α*-(aminomethyl)-, 588^{8}.
Benzylamine, phenoxymethyl-, *and -HCl*, 391^{5,6,7}.

$C_{14}H_{15}NO_2$ Carbazolecarboxylic acid, 5,6,7,8-tetrahydro-, Me ester, 2326^{7}.
o-Cresol, *α*,*α*′-iminobis-, 1216^{8}.

$C_{14}H_{15}NO_2S$ Benzenesulfonamide, *N*-*o*-methylbenzyl-, 371^{9}.

$C_{14}H_{15}NO_3$ 3-Quinaldinecarboxylic acid, 8-methoxy-, Et ester, *and chloroplatinate*, 402^{4}.

$C_{14}H_{15}NO_3S$ *p* - Toluenesulfonanilide, *o*′-hydroxy-*N*′-methyl-, 2839^{1}.

$C_{14}H_{15}NS$ 2 - Thiophenemethylamine, *N*-allyl-*N*-phenyl-, 390^{8}.

$C_{14}H_{15}N_3$ Aniline, *N*, *N*-dimethyl-*p*-phenylazo-, 1062^{8}.
m-Toluidine, 6-*p*-tolylazo-, 2836^{1}.

$C_{14}H_{15}N_3O$ Anthranilaldehyde, methoxy-, phenylhydrazone, 402^{5,8}.

$C_{14}H_{15}N_3O_3$ Isoindazole, 1-acetyl-7-(diacetylamino)-5-methyl-, 2496^{9}.

$C_{14}H_{15}N_3O_3S$ Benzenesulfonic acid, *p*-(*p*-dimethylaminophenylazo)-, *sodium salt*—see *Methyl orange*.
Hydantoin, 1 - (*N*-benzoylalanyl)-5-methyl-2-thio-, 3298^{9}.

$C_{14}H_{15}N_3O_4$ Δ^{2}-Cyclopentenone, 2-hydroxy-3-methyl-, *p* - nitrophenylhydrazone, acetate, 2484^{8}.
2 - Indanglyoxylic acid, 1 keto-, Et ester, semicarbazone, 1078^{1}.

$C_{14}H_{15}N_5O_7$ Indazole, 4,5,6,7 - tetrahydro-5-methyl-, picrate, 389[3].
p-Phenylenediamine, *N*, *N*-dimethyl-, picrate, 203[8].

$C_{14}H_{16}AsNO_5S$ Arsanilic acid, *N*-methyl-*N*-*p*-tolylsulfonyl-, 2838[5].

$C_{14}H_{16}AsN_3O_4$ Benzenearsonic acid, 3-amino-4-(3-amino-*p*-toluyl)-, 394[2].

$C_{14}H_{16}As_2N_2O_8S_2$ Methanesulfonic acid, 5-arsenobis[2-hydroxyanilino-, 264[8].

$C_{14}H_{16}Br_2HgN_2$, 3665[1].

$C_{14}H_{16}Br_2O_2$ Anthraquinone, dibromodecahydro-, 1405[2].

$C_{14}H_{16}Br_2O_4$ Cumidic acid, α,α′-dibromo-, di-Et ester, 380[8].

$C_{14}H_{16}Cl_2HgN_2$, 3665[1].

$C_{14}H_{16}Fe_2I_7O_{16}$, 1769[4].

$C_{14}H_{16}HgI_2N_2$, 3665[1].

$C_{14}H_{16}IN_5O_7$ Pyridine, 1,2-dihydro-1-methyl-2-methylimino-, methiodide, picrate, 3009[4].

$C_{14}H_{16}N_2$ Benzidine, *N*, *N*-dimethyl-, *and* - *HCl*, 585[4], 587[1].
Bitoluidine, 2650[8]; *and di-HCl*, 401[1].
Indazole, 4,5,6,7 - tetrahydro-5-methyl-2-phenyl-, *and perchlorate*, 389[3].
Isoindazole, 4,5,6,7 - tetrahydro-5-methyl-1-phenyl-, *and perchlorate*, 389[4].
Tolidine, 3665[1].

$C_{14}H_{16}N_2O_2$ 4,4′-Bi-*o*-anisidine, 1552[2].
4,4′ - Bi-*o*-cresol, 6,6′-diamino-, *di-HCl*, 187[6].
Pyrazolecarboxylic acid, 1-benzylmethyl-, Et ester, 3006[4,5].

$C_{14}H_{16}N_2O_2S$ Hydantoin, 1-benzoyl-5-isobutyl-2 thio-, 3298[9].

$C_{14}H_{16}N_2O_3$ 3-Indolecarbinol, α-(acetamidomethyl)-, acetate, 758[9].
2,5 - Pyrrolopyrazine - 1,4 - dione, 2,3,6,7,-8,8₁-hexahydro - 3 - (*p*-hydroxybenzyl)-, isomers, 3169[7].

$C_{14}H_{16}N_2O_4$ Barbituric acid, 5-(benzyloxymethyl)-5-ethyl-, 581[8].
Valeric acid, α,β,γ-triketo-, Et ester, tolylhydrazone, 2483[6].

$C_{14}H_{16}N_2O_5$ 3-Hydantoinacetic acid, 5-*p*-methoxybenzyl-α-methyl , 366[7].

$C_{14}H_{16}N_2O_6W$, 3657[1].

$C_{14}H_{16}N_2S_2Zn$ *m*-Toluidine, 6-mercapto-, Zn deriv., 2327[6].

$C_{14}H_{16}N_4$ + H_2O *s*-Triazole, 3-cinnamalamino-5-isopropyl-, 3293[8].

$C_{14}H_{16}N_4O_6$ + $2H_2O$ Isocreosol, 4,6-dinitro-, phenylhydrazine salt, 3449[3].

$C_{14}H_{16}N_4O_{10}$ 4,4′-Bi-*m*-cresol, 2,6,2′,6′-tetranitro-, di-NH_4 deriv., 187[5].

$C_{14}H_{16}O$ Acetophenone, cyclohexenyl-, 3447[4].

$C_{14}H_{16}O_2$ 9,10-Anthradiol, 1,2,3,4,5,8 - hexahydro-, 1404[8].
Anthraquinone, 1,2,3,4,5,6,7,8-octahydro-, 1404[3,8].
Phenanthrenequinone, 1,2,3,4,5,6,7,8-octahydro-, 1404[4], 1405[2].
1,2-Propanediol, 2-methyl-1-(1-naphthyl)-, 2851[9].

$C_{14}H_{16}O_5$ 2-Indancarboxylic acid, 1-keto-5,6-dimethoxy-, Et ester, 2326[1].
Malonic acid, *p*-hydroxybenzal-, di-Et ester, 1079[2].

$C_{14}H_{16}O_6$ 1 - Isobenzofuranacetic acid, 1,2-dihydro-2-keto-4,5-dimethoxy-, Et ester, 2331[2].

$C_{14}H_{16}O_8$ Glucuronic acid, monobenzoate, Me ester, 3689[8].

$C_{14}H_{17}AsN_2O_5S$ Arsanilic acid, *N*-(3-amino-*p*-tolylsulfonyl)-*N*-methyl-, *and salts*, 2838[7].

$C_{14}H_{17}BrO$ Anthrol, bromooctahydro-, 1404[9], 1405[2].
9-Phenanthrol, bromo-1,2,3,4,5,6,7,8-octahydro-, 1404[4].

$C_{14}H_{17}BrO_7$ 1,2 - Propanediol, 1-(2-bromo-5,6-dimethoxy - 3,4 - methylenedioxyphenyl)-, monoacetate, 3450[8].

$C_{14}H_{17}N$ Carbazole, 1,2,3,4 - tetrahydrodimethyl-, 913[1], 2831[4].
1-Naphthylamine, *N*, *N*-diethyl-, 384[9].
o-Toluquinaldine, 5-isopropyl-, *and chloroaurate*, 1238[9].

$C_{14}H_{17}NO$ Acetophenone, cyclohexenyl-, oxime, 3447[4].
Cyclohexanone, 2 - (anilinomethylene)-4-methyl-, 389[4].

$C_{14}H_{17}NO_2$ Anthraquinone, 2-amino-1,2,3,4,5,-6,7,8-octahydro-, 1405[4].
9 - Anthrol, 1,2,3,4,5,6,7,8 - octahydronitroso-, 1404[3].
Carbazole, 1,2,3,4-tetrahydro - 6,7 - dimethoxy-, 1604[6].

$C_{14}H_{17}NO_3$ Cyclopentanecarboxylic acid, 1-(*N*-acetylanilino)-, 172[1].
α-Pentenic acid, γ-keto-α-(*N*-methylanilino)-, Et ester, 2823[1].

$C_{14}H_{17}NO_4S$ Tolylsulfuric acid, *p*-toluidine salt, 1796[2].

$C_{14}H_{17}NO_5$ Glutamic acid, *N*-benzoyl-, di-Me ester, 1994[3].
4-Pyranol, tetrahydro - 2,6 - dimethyl-, *p*-nitrobenzoate, 1624[2].

$C_{14}H_{17}NO_6$ Carbamic acid, [(dimethoxy-2-phthalidyl)methyl] , Et ester, 2331[1,2].

$C_{14}H_{17}N_3O$ Acetophenone, cyclopentenyl-, semicarbazone, 3447[7].

$C_{14}H_{17}N_3OS$ 1,4 - α - Naphthothiopyrone, 2,3,-7,8,9,10 - hexahydro-, semicarbazone, 202[2].

$C_{14}H_{17}N_3O_4$ 4-Piperidinebutyric acid, 3,5-dicyano-2,6-diketo 4-methyl-, Et ester, 172[8].

$C_{14}H_{17}N_3S$ Δ[2] - Cyclohexenone, 3 methyl-5-phenyl-, thiosemicarbazone, 3161[8].
2(3)-Thiazolone, 3-ethyl-4-phenyl-, isopropylidenehydrazone, 416[7].

$C_{14}H_{17}N_5O_4$ Uric acid, 5-anilino 4,5-dihydro-4-hydroxy-1,3,9-trimethyl-, 2826[7].

$C_{14}H_{17}NaO_6S$ Malonic acid, benzylsulfonyl-, di-Et ester, Na deriv., 1409[3].

$C_{14}H_{18}$ Anthracene, octahydro-, 2455[6].

$C_{14}H_{18}Br_2O_4$ Veratrole, 4 bromo-3-(β-bromo-α-ethoxypropyl) - 5,6 - methylenedioxy)-, 3450[7].

$C_{14}H_{18}Cl_2N_2O_2S$ Sulfone, bis(β-chloroethyl), dipyridine addn. compd., *chloroplatinate*, 40[8].

$C_{14}H_{18}Cl_2N_2S$ Sulfide, bis(β-chloroethyl), dipyridine addn. compd., *chloroplatinate*, 40[8].

$C_{14}H_{18}HgI_3N$ Quinoline, complex salt with $C_5H_{11}I$ and HgI_2, 3695[8].

$C_{14}H_{18}IN$ 2-Isobutyl-1-methylquinolinium iodide, 1082[9].

$C_{14}H_{18}INO$ Benzyl(2 - furylmethyl)dimethylammonium iodide, 390[7].

$C_{14}H_{18}INS$ Benzyldimethyl - 2 - thienylmethylammonium iodide, 390[8].

$C_{14}H_{18}N_2O$ 1-Indanone, 2-(1-piperidyl)-, oxime, 383[2].
Lepidine, 2-dimethylaminoethoxy-, P 1304[6].

Quinaldine, 4-dimethylaminoethoxy-, P 1304[6].
$C_{14}H_{18}N_2O_2$ Butyric acid, β-[(α - cyanobenzyl)-amino]-, Et ester, *and* -*HCl*, 3283[4].
Cyclohexanone, 2-hydroxy-, phenylhydrazone, acetate, 2665[6].
$C_{14}H_{18}N_2O_4$ 1 - Piperidinepropionic acid, α-(p-nitrophenyl)-, 1414[1].
Proline, 1-tyrosyl-, 3169[6,7].
$C_{14}H_{18}N_2O_5$ Glycine, *N*-(β - carbomethoxy-aminobutyryl)-*N*-phenyl-, *and* NH_4 *salt*, 44[4].
1 - Piperidinepropionic acid, α-hydroxy-α-(o-nitrophenyl)-, 1414[3].
$C_{14}H_{18}N_4O_2$ 4,4′-Bi-m-cresol, 2,6,2′,6′-tetra-amino-, *8-HCl*, $SnCl_4$ *salt*, 187[5].
$C_{14}H_{18}N_4O_3$ 4 - Pyrazolecarboxylic anhydride, 1,3,5,1′,3′,5′-hexamethyl-, 2857[1].
$C_{14}H_{18}N_4O_4P_2$ Tetrazdiphosphinium, *P*,*P*′-di-p-tolyloxy - *P*,*P*′ - dioxotetrahydro , 914[1].
$C_{14}H_{18}N_4O_9$ Caffeine citrate, 1030[2].
$C_{14}H_{18}O$ Anthrol, octahydro-, 1403[7], 1404[3].
9-Phenanthrol, 1,2,3,4,5,6,7,8 - octahydro-, 1404[4].
$C_{14}H_{18}O_2$ 9,10-Anthradiol, 1,2,3,4,5,6,7,8-octahydro-, 1404[3,7].
3 - Dibenzofuranol, 1,2,3,4,4₁,9₁ hexahydro-6,9₁-dimethyl-(?), 400[6].
Veratrole, 3,6-diallyl-, 1798[2].
$C_{14}H_{18}O_4$ Butyric acid, resorcinol di-ester, 3163[7].
Caprophenone, 2,4-dihydroxy , monoacetate, 2995[6].
Durohydroquinol, diacetate, 1984[3].
2-Pentanol, 4-methyl-, H phthalate, 577[4].
1,3 - Propanediol, 2-methyl-2-phenyl-, diacetate, 385[4].
Resorcinol, dibutyryl-, 3163[7].
$C_{14}H_{18}O_6$ Acetophenone, α-hydroxy-3,4-dimethoxy-, α-methoxypropionate, 2827[7,8].
$C_{14}H_{18}O_6S$ Malonic acid, benzylsulfonyl , di-Et ester, 1409[4].
$C_{14}H_{18}O_7$ Acetophenone, p-hydroxy-, tetra-Ac glucoside, 593[1].
$C_{14}H_{18}O_{18}S_4$ + $2H_2O$ Copper sulfate (basic), 3401[8].
$C_{14}H_{19}BrO_9$ Mannose, bromotetraacetyl , 1790[2].
$C_{14}H_{19}ClO_9$ Glucose, acetochloro , 2828[1].
$C_{14}H_{19}N$ Acridine, 1,2,3,4,4₁,5,10,10₁-octahydro-2(or 4)-methyl-, 1628[8].
Δ[2] - Cyclohexenylamine, 2-benzyl *N*-methyl-, -*HBr*, 2665[8].
Piperidine, 1-α-vinylbenzyl-, *and chloroplatinate*, 1053[4].
Quinoline, 1,2-dihydro 2-isobutyl 1-methyl , 1081[8].
$C_{14}H_{19}NO$ 9-Anthrol, 10-amino-1,2,3,4,5,6,-7,8-octahydro-, 1404[8].
9-Phenanthrol, 10-amino - 1,2,3,4,5,6,7,8-octahydro-, 1404[8].
$C_{14}H_{19}NO_2$ 9,10-Anthradiol, 2-amino-1,2,3,4,-5,6,7,8-octahydro , -*HCl*, 1405[4].
4 - Pyrancarboxanilide, tetrahydro-2,6-dimethyl-, 1624[3].
$C_{14}H_{19}NO_4$ Cinchomeronic acid, 6-*tert*-butyl-2-methyl-, mono-Et ester, 3206[9].
$C_{14}H_{19}NO_5$ Carbanilic acid, o-carbethoxyoxy , Bu ester, 2319[9].
—, o-carboisopropoxyoxy-, Pr ester, 2320[1].
—, o-carbopropoxyoxy-, isopropyl ester, 2320[1].
$C_{14}H_{19}NO_6$ 1,2,3 - Cyclobutanetricarboxylic acid, 2-cyano-, tri-Et ester, 49[7].
Δ[4] - 1,3 - Cyclohexenedicarboxylic acid, 2-formyl - 6 - keto - 4 - methyl-, di-Et ester, aldoxime, 45[9].
Malonic acid, [(5 - carbethoxy-2-ethyl-4-methyl-3-pyrryl)methyl]-, 1236[8].
2,4 - Pyrroledicarboxylic acid, 5-(hydroxymethyl)-3-methyl-, di-Et ester, acetate, 2159[9], 2160[5].
$C_{14}H_{19}NO_{12}$ *d*-Glucose, tetraacetyl-, 6-nitrate, 742[8].
$C_{14}H_{19}N_3O$ Pentenophenone, ethyl-, semicarbazone, 3447[8].
$C_{14}H_{19}N_3O_2$ 2,5 - Pyrrolopyrazin-7-ol, octahydro-2-phenylcarbamyl-, 55[6].
$C_{14}H_{19}N_3O_3$ Cyclohexanone, 2-ethoxy-, p-nitrophenylhydrazone, 2665[7].
$C_{14}H_{20}As_2N_6$ Arsenobenzene, 3,5,3′,5′-tetra-amino - 4,4′ - bis(methylamino)-, *tetra-HCl*, 2993[4].
$C_{14}H_{20}BrN_3O$ Pyramidone, methobromide, 2857[6].
$C_{14}H_{20}Br_{10}N_2$ Nicotine, di-HBr, $C_2H_2Br_4$ addn. compd., 1086[4].
$C_{14}H_{20}Cl_2N_4Pt$, 2961[2].
$C_{14}H_{20}MoN_6O_8$ Diguanidine dipyrogallol molybdate, 557[1].
$C_{14}H_{20}N_2O_2$ Durene, diacetamido-, 1984[3].
1-Piperidinepropionic acid, α-(p-amino phenyl) , *di-HCl*, 1414[1].
$C_{14}H_{20}N_2O_5S$ Alanine, *N* - (*N*-tolylsulfonyl-glycyl)-, Et ester, 3298[5].
$C_{14}H_{20}N_4O_3$ Lysine, $N^ε$-benzoyl - $N^α$ - guanyl-, 3690[7].
$C_{14}H_{20}O$ Δ[5]-2-Heptenol, 2-benzyl-, 1602[3].
—, 6-methyl-2-phenyl-, 3687[1].
$C_{14}H_{20}O_2$ Butyric acid, p-isopropylbenzyl ester, 2488[2].
Caprylophenone, α hydroxy-, 1786[7].
Cumic acid, Bu and isobutyl esters, 1793[6].
7-p-Cymenecarboxylic acid, Pr and isopropyl esters, 2488[4].
Isobutyric acid, p-isopropylbenzyl ester, 2488[2].
9,10 - Phenanthrenediol, 1,2,3,4,5,6,7,8,-9,10-decahydro-, 1404[6].
$C_{14}H_{20}O_3$ Caprylophenone, 2,4-dihydroxy-, 2320[2].
$C_{14}H_{20}O_4$ 2-Butanol, 4-(3,4-dimethoxyphenyl)-, acetate, 739[7].
Dicyclopentadieneglycol, dihydro-, diacetate, 384[6].
$C_{14}H_{20}O_4S$ 4-Pyranol, tetrahydro-2,6-dimethyl-, p-toluenesulfonate, 1624[3].
$C_{14}H_{20}O_5S$ [1,5(?)] - Glucoside, 4-methyl-α-benzylthio-, 171[1].
$C_{14}H_{20}O_7$ 3,5-Heptanedicarboxylic acid, 4-formyl-2,6-diketo , di Et ester, 45[6].
$C_{14}H_{20}O_8$ 1,1,4,4 - Cyclohexanetetrol, tetra-acetate, 1064[9]
$C_{14}H_{20}O_{10}$ *d* Glucose, tetraacetyl-, 742[8], 1789[8].
$C_{14}H_{21}AsN_2O_7$ Carbamic acid, *N*,*N*′ (p-arsono-o phenylene)bis-, di-Pr ester, 1605[8].
$C_{14}H_{21}N$ Carbazole, 1,2,3,4,5,6,7,8 - octahydro-3,9-dimethyl-, 913[1].
Cyclohexylamine, 2 benzyl - *N* - methyl-, 2666[1].
Kairoline, 2-isobutyl-, 1082[3].
$C_{14}H_{21}NO_2$ 1-Butanol, 2-ethyl-2-methyl-, carbanilate, 2481[4].
Ethylamine, β-[3(and 6)-allyl-o anisyloxy]-*N*,*N*-dimethyl-, P 2392[8].
Pyrrole, diethyldipropionyl-, 3403[7].
$C_{14}H_{21}NO_3S_2$ Propionic acid, α-[(dithiocarboxy)oxy]-, *S*-Et ester, α-methylbenzylamine salt, 3281[1,2].

$C_{14}H_{21}NO_4$ Cinchomeronic acid, *N*-methyl-γ-dihydrodimethyl-, di-Et ester, 3296[6].

$C_{14}H_{21}NO_6$ Aniline, *p-sec*-butyl-, acid tartrate, 1983[8].

$C_{14}H_{21}N_4O_{11}P$ + $4H_2O$ Imidazole-phosphorus compd., 1243[9].

$C_{14}H_{21}N_5O_7S$ Pseudourea, α,β-diethyl-α,γ-dimethylthio-, methopicrate, 374[4].

$C_{14}H_{22}Cu_4N_{14}O$, 3401[2].

$C_{14}H_{22}Hg$ 1-Heptine, 1,1′-mercuribis-, 1054[1].

$C_{14}H_{22}IN$ 1,2,3,4-Tetrahydro-2-isobutyl-1-methylquinolinium iodide, 1082[2].

$C_{14}H_{22}N_2O$ Acetamidine, *N*, *N*-diethyl-*N′*-*p*-phenetyl-, 1218[8].

Base, m. 96–7°, from dicyclopentadiene, 384[7].

2(1)-Pyridone, 1-butyl-3-(tetrahydro-1-methyl-2-pyrryl)-, 2863[1].

$C_{14}H_{22}N_2O_2$ (See also *Tutocaine.*)

Benzoic acid, amino-, diethylaminopropyl ester, P 3061[8]; *-HCl*, 1852[8].

$C_{14}H_{22}N_2O_3S$ Lactic acid, dimethylthionocarbamate, α-methylbenzylamine salt, 3281[4].

$C_{14}H_{22}N_4O_4S$ Arginine, *N*-$^{\alpha}$methyl-N^{α}-*p*-tolylsulfonyl-, 3690[9].

Lysine, N^{ϵ}-guanyl-N^{α}-*p*-tolylsulfonyl-, 3690[9].

$C_{14}H_{22}N_4O_7$ Butylamine, *N*, *N*, α, α-tetramethyl-, picrate, 3280[4].

$C_{14}H_{22}N_6O_7$ Ethylpentamethylguanidinium picrate, 374[9].

$C_{14}H_{22}O_2$ Benzene, 1-hexyl-2,4-dimethoxy-, 2995[9].

Cumaldehyde, di-Et acetal, 1793[4].

Resorcinol, dibutyl-, 3163[7].

—, 4-octyl-, 2320[3].

$C_{14}H_{22}O_3$ Camphor, 3-(hydroxymethyl), propionate, 1227[9].

$C_{14}H_{22}O_4$ Succinic acid, monobornyl ester, 2998[4].

—, monoisobornyl ester, 2998[4].

$C_{14}H_{22}O_5$ Cyclohexaneacetic acid, 4-carboxy-3-keto-1-methyl-, di-Et ester, 172[6].

$C_{14}H_{22}O_7$ Galactose, acetyldiacetone-, 1389[3].

$C_{14}H_{22}O_8$ Bimalonic acid, tetra-Et ester, 3689[9].

$C_{14}H_{23}IN_2$ 1-Butyl-3-(tetrahydro-1-methyl-2-pyrryl)pyridinium iodide, *-HI*, 2863[1].

$C_{14}H_{23}N$ Aniline, *N*-butyl-*N*-isobutyl-, 2991[1].

$C_{14}H_{23}NO$ Triethylamine, β-(α-methoxybenzyl)-, *and -HCl*, 1604[9].

$C_{14}H_{23}NO_2$ 2-Propanol, 1,1′-phenyliminobis-[2-methyl-, *and chloroplatinate*, 2834[4].

$C_{14}H_{23}N_3O_3$ 5-Epicamphorcarboxylic acid, Et ester, semicarbazone, 2674[9].

$C_{14}H_{23}N_3O_7$ 1,1,2-Butanetricarboxylic acid, 3-keto-, tri-Et ester, semicarbazone, 3690[2].

$C_{14}H_{24}AsI$ Ethyldimethyl(δ-phenylbutyl)arsonium iodide, 2839[6].

$C_{14}H_{24}N_2$ Pyridine, 1,2-dihydro-1-methyl-2-propyl-3(or 5)-(tetrahydro-1-methyl-2-pyrryl)-, 2863[2].

$C_{14}H_{24}O_3$ Ketone, hydroxymethyl 1,2,2,3-tetramethylcyclopentyl, propionate, 1399[6].

1-Propanone, 3-hydroxy-1-(1,2,2,3-tetramethylcyclopentyl)-, acetate, 1399[7].

$C_{14}H_{24}O_4$ Malonic acid, cyclohexylmethyl-, diethyl ester, 3160[2].

$C_{14}H_{24}O_5$ Malonic acid, propyl(β-vinyloxyethyl)-, di-Et ester, 367[7].

$C_{14}H_{24}O_7$ Succinic acid, diethoxyacetyl-, di-Et ester, 388[9].

$C_{14}H_{24}O_8S$ Fructose, α-diacetone-3-ethanesulfonyl-, 2663[3].

d-Glucose, diacetoneethanesulfonyl-, 2662[8].

$C_{14}H_{25}N$ Carbazole, dodecahydro-3,9-dimethyl-, 913[3].

$C_{14}H_{25}NO$ α-Nonenic acid, piperidide, 2845[1].

Phenol base, m. 158–9°, from *o*-phenoxymethylbenzylamine, 391[9].

$C_{14}H_{25}NO_5$ Galactosyl-6-dimethylamine, diacetone, 1597[6].

$C_{14}H_{25}N_3O$ 2-Heptanone, 3-Δ^1-cyclohexenyl-(?), semicarbazone, 3287[5].

$C_{14}H_{25}N_3O_3$ 2,5-Piperazinedione, 3-isobutyl-4-leucyl-, 55[4].

$C_{14}H_{25}N_4NiO_4$, 2466[2].

$C_{14}H_{26}O$ Cyclotetradecanone, 1792[5].

$C_{14}H_{26}O_2$ 4,4′-Bipyran, octahydro-2,6,2′,6′-tetramethyl-, 1624[3].

Cyclohexanecaprylic acid, 3160[5].

Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, butyrate, 1399[8].

Δ^8-5-Decenol, 5,9-dimethyl-, acetate, 3687[1].

2,4-Tetradecanedione, 738[9].

Tetradecenic acid, 2420[4], 2482[3].

$C_{14}H_{26}O_3$ Acetic acid, ethoxy-, menthyl ester, 43[8].

Lauric acid, λ-formyl-, Me ester, 1590[7].

Myristic acid, γ-keto-, 3445[3].

$C_{14}H_{26}O_4$ Adipic acid, di-Bu ester, 3689[7].

Brassylic acid, mono-Me ester, 1590[5].

1,10-Decanedicarboxylic acid, di-Me ester, 1789[2].

1,12-Dodecanedicarboxylic acid, 1789[3].

Succinic acid, di-Am ester, 3689[8].

$C_{14}H_{26}O_5$ Malonic acid, (butoxymethyl)ethyl, di-Et ester, 581[9].

—, ethyl(isobutoxymethyl), di-Et ester, 581[9].

$C_{14}H_{26}O_5S$ 4-Pyranol, tetrahydro-2,6-dimethyl-, sulfite, 1624[4].

$C_{14}H_{27}CuNO_2$ 7-Tetradecanone, 8-hydroxy, oxime, Cu deriv., 1055[6].

$C_{14}H_{27}NO$ Pelargonic acid, piperidide, 2845[1].

$C_{14}H_{27}NO_3$ Myristic acid, γ-keto-, oxime, 3445[3].

$C_{14}H_{27}NO_4$ Propionic acid, β,β′-(butylimino)-bis-, di-Et ester, 3010[2].

—, β,β′-(*sec*-butylimino)bis-, di-Et ester, 3010[2].

—, β,β′-isobutyliminobis-, di-Et ester, 3010[2].

$C_{14}H_{27}N_3O$ Cyclotridecanone, semicarbazone, 1792[5]

$C_{14}H_{27}O_5P$ 4-Pyranol, tetrahydro-2,6-dimethyl-, phosphite, 1624[3].

$C_{14}H_{28}BrNO$ [β-Keto-β-(1,2,2,3-tetramethylcyclopentyl)ethyl]trimethylammonium bromide, 1399[4].

$C_{14}H_{28}Br_2$ Tetradecane, 1,14-dibromo-, 1789[2].

$C_{14}H_{28}Br_2N_4$ Spiro[piperidine-1,1′-piperazine-4′,1″-piperidine], *N*, *N′*-dibromo-, 2862[3].

$C_{14}H_{28}CuN_4O_4$, 2466[1].

$C_{14}H_{28}INO_2$ Cyclohexaneacetic acid, α-dimethylamino-3-methyl-, Et ester, methiodide, 903[9].

$C_{14}H_{28}N_2$ 4-Heptanone, azine, 899[9], 2309[8].

$C_{14}H_{28}N_2O_2S$ Piperidine, β,β′-sulfonylbis-[1-ethyl-, 40[3].

$C_{14}H_{28}N_2S$ Piperidine, β,β′-thiobis[-1-ethyl-, 40[3].

$C_{14}H_{28}N_4O_4Pd$, 2466[2].

$C_{14}H_{28}O_2$ (See also *Myristic acid.*)

Caprylic acid, α-ethyl-, Bu ester, 863[1].

7-Tetradecanone, 8-hydroxy-, 1055[7].

$C_{14}H_{28}O_3$ Tridecoic acid, hydroxy-, Me 1590[9], 1598[9].

$C_{14}H_{28}O_6$ *d*-Glucose, tetraethyl-, 380[5].
$C_{14}H_{29}NO_4$ β-Alanine, *N*(γ,γ-diethoxy-α-methylpropyl)-*N*-methyl-, Et ester, 1788[6].
$C_{14}H_{30}Hg$ Mercury diheptyl, 3688[6].
$C_{14}H_{30}N_2O_3$ See *Eledonine*.
$C_{14}H_{30}O$ Heptyl ether, 361[8].
$C_{14}H_{30}O_2$ 5,6-Dodecanediol, 5-ethyl-, 1786[7].
 4,5-Hendecanediol, 4-propyl-, 1786[5].
 1,14-Tetradecanediol, 1789[1].
$C_{14}H_{30}O_2S_2$ 2-Butanone, bis(γ-ethoxypropyl) mercaptole, 737[3].
$C_{14}H_{31}NO_4$ Butyraldehyde, β-(formylmethylamino)-, bisdiethyl acetal, 1788[4].
$C_{14}H_{32}N_2O_8$ 2-Pentanol, 1-hydroxamino-4-methyl-, oxalate, 1052[3].
$C_{14}H_{32}N_4$ Piperazine, 1,4-bis(ε-aminoamyl)-, *and salts*, 2862[4,7].
 Piperidine, 1-{β-[(ε-aminoamyl)(β-aminoethyl)amino]ethyl}-, 2862[4].
$C_{14}H_{33}NO$ Tributylethylammonium hydroxide, 3747[5].
$C_{14}H_{36}Cl_6N_6Pt$ Hexamethylguanidinium chloroplatinate, 374[9].
$C_{15}H_6Cl_2O_3$ 2-Anthraquinonecarboxylyl chloride, 1-chloro-, 1628[7].
$C_{15}H_6N_2O_8$ 2-Anthraquinonecarboxylic acid, 1,8-dinitro-, 2853[5].
$C_{15}H_7AlO_7 + 2H_2O$ Morin, Al deriv., 406[1].
$C_{15}H_7BrN_2O_6$ Anthraquinone, 2-(bromomethyl)-1,8-dinitro-, 2853[5].
$C_{15}H_7BrO_4$ 2-Anthraquinonecarboxylic acid, 3-bromo-, 385[8].
$C_{15}H_7Br_3O_7$ Compd. from santalin and Br, isomers, 1405[9].
$C_{15}H_7Br_5$ Anthracene, 1,2,3,10-tetrabromo-9-(bromomethyl)-, 3003[4].
$C_{15}H_7Cl_2N$ 9-Anthronitrile, 1,5-dichloro-, 751[6].
$C_{15}H_7Cl_3O_4$ 1-Xanthenecarboxylic acid, 2,3,4-trichloro-9-keto-5-methyl-, *and Na salt*, 1231[8].
$C_{15}H_7Cl_4NO_2$ Phthalimide, tetrachloro-*N*-*p*-tolyl-, 186[5].
$C_{15}H_7FeO_7$ Morin, Fe deriv., 405[9].
 Quercetin, Fe deriv., 405[9].
$C_{15}H_8Br_2OS$ Thioflavone, 3,6-dibromo-, 198[6].
$C_{15}H_8Cl_4O_4$ Benzoic acid, 2,3,4,5-tetrachloro-6(2-hydroxy-*m*-toluyl)-, *and salts*, 1231[7,8].
 Phthalide, 3,4,5,6-tetrachloro-2-(2,3-cresyl)-2-hydroxy-, 1231[8].
$C_{15}H_8N_2O_6$ Anthraquinone, 2-methyldinitro-, 2853[4,5].
$C_{15}H_8N_2O_7$ Anthraquinone, 1-hydroxy-3-methyl-2,4-dinitro-, 1402[6].
$C_{15}H_8O_2$ Compds., m. 164° and 172°, from 2-methylanthraquinone, 2678[6].
$C_{15}H_8O_4S$ *o*-Toluic acid, α-(*o*-carboxyphenylmercapto)-α,α-dihydroxy-, dilactone, 182[7].
$C_{15}H_9BrN_2O_5S$ Cinnamonitrile, α-(*p*-bromophenylsulfonyl)-3-hydroxy-4-nitro-, 402[7].
$C_{15}H_9BrOS$ Thioflavone, 3-bromo-, 198[6].
$C_{15}H_9BrO_2$ Phthalide, brombenzal-, 1407[7].
$C_{15}H_9Br_2N_5O_7$ Imidazole, 4,5-dibromo-2-phenyl-, picrate, 2326[6].
$C_{15}H_9Br_3OS$ Thioflavanone, 3,3,6-tribromo-, 198[6].
$C_{15}H_9Br_5O_6$ Quinone, 2,6-dibromo-3-methoxy-5-(3,4,5-tribromo-2,6-dimethoxyphenoxy)-, 2320[6].
$C_{15}H_9ClN_2O_5S$ Cinnamonitrile, α-(*p*-chlorophenylsulfonyl)-3(and 5)-hydroxy-4(and 2)-nitro-, 402[7,8].
$C_{15}H_9ClO_2$ Coumarin, 6-chloro-4-phenyl-, 1238[2].
 Flavone, 6-chloro-, 1238[1].
$C_{15}H_9Cl_5O_6$ Quinone, 2,6-dichloro-3-methoxy-5-(3,4,5-trichloro-2,6-dimethoxyphenoxy)-, 2320[6].
$C_{15}H_9Cl_6NO$ 2,4-Xylanilide, α-hexachloro-, 184[7].
$C_{15}H_9NO_4$ Anthraquinone, 2-methyl-1-nitro-, P 1415[1].
$C_{15}H_9NO_5$ Anthraquinone, hydroxymethylnitro-, 1402[6].
$C_{15}H_9NS$ Thiocyanic acid, 9-anthryl ester, 747[8].
$C_{15}H_9N_3O$ 5-Pyrimidinenitrile, 1,4-dihydro-4-keto-2-(2-naphthyl)-, 206[5].
$C_{15}H_9N_3O_8$ Stilbene, 3′,4′-methylenedioxy-2,4,6-trinitro-, 3000[4], 3001[9].
$C_{15}H_9N_7O_7$ Imidazobenzotriazine, picrate, 395[6].
$C_{15}H_{10}BrNO_3S$ Carbostyril, 3-(*p*-bromophenylsulfonyl)-, 1626[8].
$C_{15}H_{10}BrN_5O_7$ Imidazole, 4(or 5)-bromo-2-phenyl-, picrate, 2327[1].
$C_{15}H_{10}Br_2$ Anthracene, 9-bromo-10-(bromomethyl)-, 3003[3,7].
$C_{15}H_{10}Br_2OS$ Thioflavanone, 3,3-dibromo-, 198[4].
 Thioflavone, dibromide, 198[7].
$C_{15}H_{10}Br_6$ Anthracene, 1,2,3,4,9-pentabromo-10-(bromomethyl)-1,2,3,4-tetrahydro-, 3003[4,7].
$C_{15}H_{10}ClNO_3$ Glyoxylyl chloride, phenyl-, oxime, Bz deriv., 360[4].
$C_{15}H_{10}ClN_3O$ 2-Naphthol, 1-(6-chloro-3-pyridylazo)-, 794[4].
 1,2,3-Triazole-4-carboxylyl chloride, 1,5-diphenyl-, 416[9].
$C_{15}H_{10}N_2O_3$ 6-Phthalazinecarboxylic acid, 1,2-dihydro-1-keto-2-phenyl-, 184[6].
 1(2)-Phthalazone, 4-hydroxy-, benzoate, 381[9].
 Phthalic anhydride, 4-formyl-, phenylhydrazone, 184[7].
 5-Pyrimidinecarboxylic acid, 1,4-dihydro-4-keto-2-(2-naphthyl)-, 206[5].
 2,4(1,3)-Quinazolinedione, mono-Bz deriv., 382[1].
 2(1)-Quinoxalone, 3-hydroxy-, benzoate, 382[1].
$C_{15}H_{10}N_2O_4$ Phthalimide, nitro-*N*-*p*-tolyl-, 186[4].
$C_{15}H_{10}N_2O_5S$ Cinnamonitrile, 3-hydroxy-4-nitro-α-(phenylsulfonyl)-, 402[7].
$C_{15}H_{10}N_2O_6$ Cinnamic acid, nitro(nitrophenyl)-, 1801[4], 2844[8,9].
$C_{15}H_{10}N_4O_6$ Indole, 2-methyl-1-picryl-, 598[5].
$C_{15}H_{10}O$ Anthrone, 10-methylene-, 2677[6].
$C_{15}H_{10}O_2$ Anthraquinone, methyl-, 192[8], 2852[7].
 Benzoic acid, *o*-phenylethinyl-(?), 1804[4].
 Phthalide, 2-benzal-, 1407[7], 1804[1].
$C_{15}H_{10}O_3$ Anthraquinone, hydroxymethyl-, 1887[9].
$C_{15}H_{10}O_3S$ Thioflavone, *S*-dioxide, 199[3].
$C_{15}H_{10}O_4$ Xanthenecarboxylic acid, 9-keto-, Me ester, 392[3,4].
$C_{15}H_{10}O_5$ Coumarin, 5,7-dihydroxy-4-(*p*-hydroxyphenyl)-, 594[9].
 Purpurin, 3-methyl-, 1402[6].
$C_{15}H_{10}O_6$ Datiscetin, 195[6].
$C_{15}H_{10}O_7$ Compd. from santalin and H_2O_2, m. 123°, 1405[9].
$C_{15}H_{10}S_2$ Thioflavone, 4-thio, 200[6].
$C_{15}H_{11}Br$ Anthracene, 9-bromo-10-methyl-, 3003[2].

$C_{15}H_{11}BrCl_2O_4$ Phenol, 3-bromo-4,5-dichloro-2,6-dimethoxy-, benzoate, 1225[7].
$C_{15}H_{11}BrN_2O_2S$ Quinoline, 2-amino-3-(*p*-bromophenylsulfonyl)-, 1626[7].
$C_{15}H_{11}BrO$ 9-Anthracenecarbinol, 10-bromo-, 3003[7].
$C_{15}H_{11}BrOS$ Thioflavanone, 3-bromo-, 198[4].
$C_{15}H_{11}BrO_3S$ Thioflavanone, 3-bromo-, *S*-dioxide, 199[2].
$C_{15}H_{11}Br_2ClO_4$ Phenol, 4,5-dibromo-3-chloro-2,6-dimethoxy-, benzoate, 3694[9].
$C_{15}H_{11}Br_3O_4$ Phenol, 3,4,5-tribromo-2,6-dimethoxy-, benzoate, 2320[4].
$C_{15}H_{11}ClN_2O_2S$ Quinoline, 2-amino-3-(*p*-chlorophenylsulfonyl)-, 1626[7].
$C_{15}H_{11}ClN_4O$ 1,2,3-Triazole-4-carboxanilide, 5-chloro-1-phenyl-, 416[9].
$C_{15}H_{11}ClO_3$ 2-(3,4-Dihydroxyphenyl)benzopyrylium chloride, 3456[7].
6-Hydroxy-2-(*p*-hydroxyphenyl)benzopyrylium chloride, 3456[9].
Methane, benzoyl(5-chloro-2-hydroxybenzoyl)-, 1238[1].
$C_{15}H_{11}ClO_4$ Butinidin chloride, 3456[7].
2-(3,4-Dihydroxyphenyl)hydroxybenzopyrylium chloride, 3456[8], 3457[1].
$C_{15}H_{11}ClO_5$ 2-(3,4-Dihydroxyphenyl)dihydroxybenzopyrylium chloride, 3457[1,2].
$C_{15}H_{11}ClO_6$ Cyanidin, chloride, 382[7].
$C_{15}H_{11}Cl_3O_4$ Phenol, 3,4,5-trichloro-2,6-dimethoxy-, benzoate, 2320[4].
$C_{15}H_{11}Cl_4NO$ 2,4-Xylanilide, $\alpha^2,\alpha^2,\alpha^4,\alpha^4$-tetrachloro-, 184[4].
$C_{15}H_{11}Cl_4O_2Sb$ Stibine, dichloro(dibenzoylmethyl)-, dichloride, 40[?][2].
$C_{15}H_{11}NO$ 1,2-Benzopyran, 2-imino-3-phenyl-, 3291[6].
3-Quinolinol, 2-phenyl-, *and -HCl*, 205[3].
$C_{15}H_{11}NO_2$ Coumarin, 3-phenyl-, oxime, 3291[7].
Phthalimide, *N*-benzyl-, 1603[5].
—, *N*-*p*-tolyl, 186[3].
$C_{15}H_{11}NO_3$ Anthraquinone, aminohydroxymethyl-, 1402[7].
$C_{15}H_{11}NO_4$ Piperonal, oxime, Bz deriv, 179[5].
$C_{15}H_{11}N_3O$ 1,2,3-Triazole-4-aldehyde, 1,5-diphenyl-, 416[9].
$C_{15}H_{11}N_3OS$ 2-Benzisothiazolecarboxylic acid, benzalhydrazide, 763[8].
1,3,4-Triazole-2-mercaptan, 1-benzoyl-5-phenyl-, 2161[8].
$C_{15}H_{11}N_3O_2$ Propiolaldehyde, *β*-phenyl-, *p*-nitrophenylhydrazone, 760[1].
$C_{15}H_{11}N_3O_3$ Indazole, 2-benzoyl-5-methyl-7-nitro-, 2497[8].
Isoindazole, 1-benzoyl-5-methyl-7-nitro-, 2497[8].
4(3)-Quinazolone, 2-methyl-3-(*m*-nitrophenyl)-, 206[9].
$C_{15}H_{11}N_3O_5$ Cinnamamide, *m*-nitro-*α*-(*p*-nitrophenyl)-, 2844[8].
Hydrocinnamonitrile, *β*-hydroxy-*m*-nitro-*α*-(*p*-nitrophenyl)-, 2844[9].
Phthalide, 4-formyl-2-hydroxy-(?), *p*-nitrophenylhydrazone, 184[5].
$C_{15}H_{11}N_3O_6$ Stilbene, 4′-methyl-2,4,6-trinitro-, 3001[9].
$C_{15}H_{11}N_3O_7$ Anisole, *p*-(2,4,6-trinitrostyryl)-, 3001[9].
$C_{15}H_{11}N_3O_8$ Guaiacol, 4-(2,4,6-trinitrostyryl)-, 3001[9].
$C_{15}H_{11}N_5O_8$ Propiolic acid, phenyl-, hydrazide, picrate, 2157[4].
$(C_{15}H_{11}O_4)_x$ Compd., m. 162-3°, from 4-(3,4-dimethoxyphenyl)-3-hydroxy-5,7-dimethoxycoumarin and HI, 2489[9].
$C_{15}H_{12}$ Hydrocarbon, m. 91–2°, from cholesterol, 1241[9].
$C_{15}H_{12}Br_2N_2S$ Benzothiazole, bromo-1-(bromotoluino)methyl-, *and -HBr*, 195[1].
$C_{15}H_{12}Br_2O_2$ Benzophenone, 3,5-dibromo-4-ethoxy-, 1736[6].
$C_{15}H_{12}Br_2O_4$ Phenol, 3,4-dibromo-2,6-dimethoxy-, benzoate, 1609[7].
$C_{15}H_{12}Br_2O_4S_2$ 2-Propanone, 1,3-bis(*p*-bromophenylsulfonyl)-, 1625[9].
$C_{15}H_{12}Cl_2O_3$ Carbonic acid, bis(*α*-chloro-*p*-cresol) ester, 401[2].
$C_{15}H_{12}N_2$ Indole, 3-(phenyliminomethyl)-, *and -HCl*, 758[7].
Propiolaldehyde, *β*-phenyl-, phenylhydrazone, 759[6].
Quinoline, 4-amino-2-phenyl-, *and salts*, 3010[8,9].
$C_{15}H_{12}N_2O$ Coumarin, phenylhydrazone, 3291[4].
—, 3-phenyl-, hydrazone, 3291[7].
$C_{15}H_{12}N_2OS$ 4-Thiazolidone, 3-phenyl-2-phenylimino-, 1980[5].
$C_{15}H_{12}N_2O_2$ Anthraquinone, 1-amino-4-methylamino-, P 425[2].
—, 1,4-diamino-2-methyl-, P 425[1].
Glyoxime, diphenyl, 1365[2].
3-Indazolecarboxylic acid, 2-phenyl, Me ester, 1806[3].
Phthalide, 4-formyl-, phenylhydrazone, 184[4].
$C_{15}H_{12}N_2O_3$ Anthraquinone, 1,3-diamino-4-hydroxy-2-methyl, 1402[7].
Glyoxylamide, *α*-(*o*-benzamidophenyl)-, 2997[8].
$C_{15}H_{12}N_2O_4$ Phthalic acid, 4-formyl-, phenylhydrazone, *and hydrate*, 184[7].
Piperonal, oxime, carbanilate, 179[5].
$C_{15}H_{12}N_2O_5$ Anisole, *p*-(2,4-dinitrostyryl)-, 3001[9].
Phthal-*p*-toluidic acid, 2-nitro-, 186[4].
$C_{15}H_{12}N_2O_6$ Guaiacol, 4-(2,4-dinitrostyryl)-, 3001[9].
$C_{15}H_{12}N_2O_7$ Creosol, 3,5-dinitro-, benzoate, 907[9].
$C_{15}H_{12}N_2O_{10}$ Catechol, 3,5-dinitro, 689[9].
$C_{15}H_{12}N_4O$ 1,2,3-Benzotriaz-4(3)-one, 3-(*α*-methylbenzalamino), 207[1].
2-Naphthol, 1-(6-amino-3-pyridylazo)-, 2499[7].
3(2)-*s*-Tetrazinone, 2-phenyl-6-*p*-tolyl, 1084[9].
1,2,3-Triazole-4-aldehyde, 1,5-diphenyl-, oxime, 416[9].
1,2,3-Triazole-4-carboxamide, 1,5-diphenyl-, 416[9].
$C_{15}H_{12}N_4O_2$ Indazole, 5-methyl-7-(*p*-nitrobenzalamino)-(?), 2497[3].
$C_{15}H_{12}N_4O_{10}$ Propane, 1,3-bis(2,4-dinitrophenoxy)-, 740[1].
$C_{15}H_{12}N_4S$ Benzil, cyclic thiocarbohydrazone, 1810[7].
$C_{15}H_{12}N_6O$ 1,2,3,5-Tetrazole-4-carboxylic acid, 1-phenyl-, benzalhydrazide, 763[8].
$C_{15}H_{12}N_6O_4S$ Benzaldehyde, *m*-nitro-, thiocarbohydrazone, 1810[6].
$C_{15}H_{12}N_6O_7$ Imidazole, 2-(aminophenyl)-, picrate, 395[3,4].
$C_{15}H_{12}N_6O_9$ Imidazole, 4,5-dihydro-2-(*m*-nitrophenyl)-, picrate, 2326[9].
$C_{15}H_{12}N_{10}O$ 1,2,3,5-Tetrazole, 4,4′-ureidobis[1-phenyl-, 763[9].
$C_{15}H_{12}O$ Anisole, phenylethinyl-, 2324[9].
Anthrone, methyl-, 2677[9], 2853[1].
Chalcone, 180[6], 1593[9], 2997[1,2].

$C_{15}H_{12}OS$ Xanthone, 2,7-dimethyl-9-thio-, *and HgBr₂ addn. compd.*, 365[1,2].
$C_{15}H_{12}O_2$ 9-Fluorenol, acetate, 1073[6].
$C_{15}H_{12}O_3$ Anthrone, hydroxymethoxy-, 411[5,6].
Benzoic acid, toluyl-, 188[1], 1407[5].
$C_{15}H_{12}O_4$ Acetic acid, (*p*-benzoylphenoxy)-, 2158[8].
$C_{15}H_{12}O_5$ Phloroacetophenone, monobenzoate, 375[9].
$C_{15}H_{12}O_6$ Diosmetin, 391[3].
Rhamnicogenol, 220[7].
$C_{15}H_{13}AsClNO$ Phenarsazine, 6-acetyl-1-chloro-1,6-dihydro-3-methyl-, 1607[1].
$C_{15}H_{13}BrN_2$ Cinnamaldehyde, *α*-bromo-, phenylhydrazone, 759[6].
$C_{15}H_{13}BrO_2$ Benzophenone, bromoethoxy-, 1736[5].
$C_{15}H_{13}ClO_4$ Phenol, 3-chloro-2,6-dimethoxy-, benzoate, 3694[9].
$C_{15}H_{13}CuNO_3$ Benzoin, *p*-methoxy-, oxime, Cu deriv., 1055[7].
$C_{15}H_{13}N$ 5,6 - Benzoquinoline, 3,4-dihydro-4-methyl-3-methylene-, 419[5].
$C_{15}H_{13}NO$ Acetamide, *N*-9-fluoryl-, 1073[8].
5-Acridineëthanol, *and -HCl*, 1239[2].
Benzoxazole, dimethyl-1-phenyl-, 2155[1].
Cinnamanilide, 1612[7].
9-Fluorylamine, *N*-acetyl-, 188[9], 189[1].
Indole, 2-*p* anisyl-, 598[5].
—, 5-methoxy-2-phenyl-, 598[6].
$C_{15}H_{13}NO_2$ Benzil, methyloxime, 752[6].
Glyoxylanilide, (*p*-tolyl)-, 1804[9].
Phenol, benzalamino-, acetate, 2841[4], 3290[7].
Phthalimidine, 2-(*p*-anisyl)-, 1803[2].
$C_{15}H_{13}NO_3$ Benzaldehyde, *o*-methoxy-, oxime, Bz deriv., 179[3].
p-Cresol, *α*-(*p*-hydroxyphenylimino)-, acetate, 2841[5].
Glyoxylanilide, (*p*-anisyl)-, 1804[9].
$C_{15}H_{13}NO_4$ 2-Naphthamide, *N*-acetyl-3-hydroxy-, acetate, 910[4].
Phenethyl alcohol, *p*-nitrobenzoate, 1610[9].
$C_{15}H_{13}NO_5$ 1-Naphthoic acid, 4-acetamido-3-hydroxy-, acetate, 1233[6].
$C_{15}H_{13}NO_6U + H_2O$, 3656[8].
$C_{15}H_{13}N_3O$ Indazole, 7-benzamido-5-methyl-, 2497[4].
Isoindazole, 7 - benzamido-5-methyl-, *and -HCl*, 2497[4,5].
$C_{15}H_{13}N_3S$ 1,4,3 - Isothiodiazine, 5-phenyl-2-phenylamino-, *and -HBr*, 416[1].
2(3)-Thiazolone, 3,4-diphenyl-, hydrazone, *and -HBr*, 416[1].
Δ^2 - 1,3,4 - Thiodiazoline, 5-phenyl-2-*p*-tolylimino-, 2161[9].
1,3,4-Triazole, 2-(benzylmercapto) - 5-phenyl-, 2161[8].
1,3,4 - Triazole - 2 - mercaptan, 5-phenyl-1-*p*-tolyl-, 2162[1].
$C_{15}H_{13}N_5$ 1,2,4 - Triazole, 5-methyl-1-phenyl 3-phenylazo-, 1224[1].
$C_{15}H_{13}N_5O_5$ Acetophenone, nitro(nitrophenyl)-, semicarbazone, 1801[6].
$C_{15}H_{13}N_5O_{11}S$ *p*-Toluenesulfono-*p*-phenetide, 3,2',3',6'-tetranitro-, 400[2].
$C_{15}H_{13}NaO_4S$ Betilon, 1113[4].
$C_{15}H_{14}$ Propene, diphenyl-, 1400[8], 2674[6].
$C_{15}H_{14}AsN_3O_4$ 6-Quinoxalinearsonic acid, 3-benzamido-1,2-dihydro-, 1606[1].
$C_{15}H_{14}AsN_3O_9$ Arsanilic acid, *N*-(4-ethoxy-3,5-dinitrobenzoyl)-, 394[6].
—, *N* - (4-ethoxy-3-nitrobenzoyl)-3-nitro-, 394[6].
$C_{15}H_{14}BrN_3O_4$ Benzaldehyde, 2-bromo-3,6-dimethoxy-, *p*-nitrophenylhydrazone, 178[9].
$C_{15}H_{14}Br_2O$ Anisole, *p*-(*α*,*β* - dibromophenethyl)-, 2324[7].
$C_{15}H_{14}Br_4N_2S$ Benzothiazole, 5-methyl-1-*p*-toluino-, tetrabromide, 195[1].
$C_{15}H_{14}Br_6N_2S$ Benzothiazole, methyl-1-toluino-, hexabromide, *and -HBr*, 195[1,2], 2857[7].
$C_{15}H_{14}ClNO$ Benzamide, *N*-*m*-(chloromethyl)-benzyl-, 391[3].
Propene, 1,3-diphenyl-, nitrosochloride, 1401[3].
$C_{15}H_{14}ClNO_2$ *o*-Benzophenetide, 5'-chloro-, 3694[6].
$C_{15}H_{14}HgNO_2$ Aniline, *N*-benzal-, HgOAc addn. compd., 1610[7].
$C_{15}H_{14}IN$ Carbazole, 3-iodo-9-isopropyl-, 1805[3].
$C_{15}H_{14}N_2$ Acridine, 5-(*β*-aminoethyl)-, *and di-HCl*, 2501[7].
$C_{15}H_{14}N_2O$ 2-Furan - *α*,*γ* - pentadienaldehyde, phenylhydrazone, 1235[7].
$C_{15}H_{14}N_2O_2$ Glyoxylanilide, (*p*-tolyl)-, oxime, 1804[9].
1-Indanamine, *N*-[*m*(*o* and *p*)-nitrophenyl]-, 756[1].
Toluic acid, formyl-(?), phenylhydrazone, 181[3].
$C_{15}H_{14}N_2O_3$ Benzaldehyde, *o*-methoxy-, carbanilate, 179[5].
Glyoxylanilide, (*p*-anisyl)-, oxime, 1804[9].
Propene, 1,3-diphenyl-, pseudonitrosite, 1401[3].
$C_{15}H_{14}N_2O_4$ Barbituric acid, 5-allyl-5-phenacyl-, 3691[3].
o-Benzophenetide, 5-nitro-, 3694[6].
$C_{15}H_{14}N_2O_8$ 2,4 - Pyrroledicarboxylic acid, 5,5' - methylenebis[3-methyl-, 2863[6].
$C_{15}H_{14}N_2S$ Benzothiazole, 4-methyl-1-*m*-toluino-, 2857[8].
$C_{15}H_{14}N_4$ *s*-Tetrazine, 2,3-dihydro-2-phenyl-6-*p*-tolyl-, 1085[1].
$C_{15}H_{14}N_4O$ 1,4 - Imidazopyridin-2(3)-one, 3-(*p* - dimethylaminophenylimino)- (?), 2858[9].
3(2) - *s* - Tetrazinone, 1,4 dihydro-4-phenyl-6-*p*-tolyl-, 1084[9].
$C_{15}H_{14}N_4O_2$ Condensation product, m. 126–7°, of 5-methyl-1-phenyl-1,2,3 - triazole-4-aldehyde and Et cyanoacetate, 416[8].
$C_{15}H_{14}N_4O_2S$ Salicylaldehyde, thiocarbohydrazone, 1811[1].
$C_{15}H_{14}N_4O_3$ Acetophenone, 4-(*m*-nitrophenyl)-semicarbazone, 175[6].
$C_{15}H_{14}N_4O_4$ Anthranilic acid, *N*-acetyl-, *β*-(*m* - nitrophenyl)hydrazide, 206[9].
Propiophenone, 2,4 - dinitrophenylhydrazone, 364[3].
$C_{15}H_{14}N_4O_6$ Benzaldehyde, 3,6-dimethoxy-2-nitro-, *p* - nitrophenylhydrazone, 178[9].
$C_{15}H_{14}N_4O_9S$ *p*-Toluenesulfono - *p* - phenetide, trinitro-, *and NH₃ addn. compd.*, 400[1,2].
$C_{15}H_{14}N_4S$ Benzaldehyde, thiocarbohydrazone, 1810[9].
$C_{15}H_{14}N_6O_5$ 2-Propanone, 1-hydroxy-, *p* - nitrophenylosazone, 2659[8].
$C_{15}H_{14}O$ Anisole, (*α* - methylenebenzyl)-, 2674[6].
—, *p*-styryl-, 2324[7].
Benzophenone, *o*,*p*-dimethyl-, 385[7].
Fluorene, ethyl 9-fluoryl, 2675[7].
Δ^2-1-Propenol, 1,3 - diphenyl-, 906[7].
Propionaldehyde, *α*,*β*-diphenyl-(?), 1401[3].
Propiophenone, phenyl-, 906[7], 2324[9], 2997[5].
$C_{15}H_{14}O_2$ Acetophenone, *α*-*p*-anisyl-, 2324[6].
—, *p*-methoxy-*α*-phenyl-, 2158[8].

Benzophenone, *p*-ethoxy-, 1736^{6}, 2158^{4}.
—, *p*-methoxy-*o'*-methyl-, 385^{8}.
Ethylene oxide, α-anisyl-β-phenyl-, 1610^{7}, 2850^{5}.
2-Propanone, 1-hydroxy-1,3-diphenyl-, 906^{8}.
α-Toluic acid, benzyl ester, 409^{2}.
$C_{15}H_{14}O_2S$ Benzophenone, *p,p'*-dimethoxythio-, 2977^{1}; *HgBr$_2$ and HgCl$_2$ addn. compds.*, 365^{2}.
$C_{15}H_{14}O_3$ Anisaldehyde, 2-benzyloxy-, 382^{7}.
Benzaldehyde, 4-benzyloxy-2-methoxy-, 382^{7}.
Benzophenone, 4-hydroxy-3-methoxy-2'-methyl-, 402^{1}.
Isocreosol, benzoate, 3449^{6}.
Lapachol, 3309^{8}.
Propiophenone, dihydroxyphenyl-, 2320^{5}, 3163^{6}.
$C_{15}H_{14}O_4$ Phloropropiophenone, β-phenyl-, 197^{1}.
Propiophenone, trihydroxyphenyl-, 3163^{6}.
$C_{15}H_{14}O_4S$ Acetophenone, α-(*p*-anisylsulfonyl), 419^{9}.
$C_{15}H_{14}O_5$ 3-Furancarboxylic acid, 3-acetyl-2,3-dihydro-2-keto-5-phenyl-, Et ester, 404^{7}.
Isomethysticin, 405^{2}.
Methysticin, 405^{2}.
2-Naphthoic acid, 3-carbethoxyoxy-, Me ester, 1616^{4}.
Phloretin, 1030^{8}.
Santalin, 1405^{5}.
$C_{15}H_{14}O_6$ Acacatechol, 2489^{3}.
1,2-Benzopyran-3-carboxylic acid, 6-hydroxy-2-keto-5,7,8-trimethyl-, acetate, 2320^{7}.
Catechol, 382^{7}, 2489^{3}.
Epicatechol, 382^{8}.
$C_{15}H_{14}S_3$ Carbonic acid, trithio-, dibenzyl ester, 1220^{1}; di-*p*-tolyl ester, 914^{8}.
$C_{15}H_{15}AsN_2Na_2O_7S$ Arsanilic acid, *N*-(3-aminoanisoyl)-, sodium formaldehyde-sulfoxylate, 394^{2}.
$C_{15}H_{15}AsN_2O_6$ Arsanilic acid, *N*-(3-acetamido-4-hydroxybenzoyl)-, 394^{6}.
$C_{15}H_{15}AsN_2O_7$ Arsanilic acid, *N*-(4-ethoxy-3-nitrobenzoyl)-, 394^{6}.
$C_{15}H_{15}BrN_2$ *o*-Toluidine, *N*-[α-(*p*-bromoanilino)-ethylidene]-, 1799^{4}.
$C_{15}H_{15}BrN_2O$ Acetophenone, *p*-methoxy-, *p*-bromophenylhydrazone, 598^{4}.
$C_{15}H_{15}BrN_2O_2$ 2-Pyrrolecarboxylic acid, 4-bromo-3-methyl-5-(phenyliminomethyl)-, Et ester, *and* ·*HCl*, 2160^{2}.
$C_{15}H_{15}BrO_4$ 1,2-Benzopyran-3-carboxylic acid, 6,8$_1$-dihydro-2,6-diketo-5,7,8-trimethyl-, β-bromoethyl ester, 2320^{7}.
$C_{15}H_{15}ClN_4O_7$ Phenethylamine, (chloromethyl)-, picrate, 391^{7,8}.
$C_{15}H_{15}ClO$ Bibenzyl, α-chloro-α'-methoxy-, 2997^{8}.
$C_{15}H_{15}ClO_4$ 1,2-Benzopyran-3-carboxylic acid, 6,8$_1$-dihydro-2,6-diketo-5,7,8-trimethyl-, β-chloroethyl ester, 2320^{7}.
$C_{15}H_{15}CoN_4O_4$, 1962^{4}.
$C_{15}H_{15}Co_2Mo_3N_3O_{12}$ Cobalt pyridine molybdate, 1185^{1}.
$C_{15}H_{15}N$ 1-Indanamine, *N*-phenyl-, 755^{9}.
Quinoline, 1,2,3,4-tetrahydro-2-phenyl-, 419^{8}.
$C_{15}H_{15}NO$ Acetanilide, *N*-methyl-*p*-phenyl-, 2848^{1}.
Benzaldehyde, *m*(and *p*)-(*p*-dimethylaminophenylazo)-, 2830^{8,9}.
Propiophenone, β-phenyl-, oxime, 906^{7}.
$C_{15}H_{15}NOS$ Acetanilide, *m*-(benzylmercapto)-, 1063^{1}.
Benzoic acid, *p*-dimethylaminothiol-, Ph ester, 371^{4}.
$C_{15}H_{15}NO_2$ Acetophenone, *p*-methoxy-α-phenyl-, oxime, 2158^{8}.
Acridinecarboxylic acid, 1,2,3,4-tetrahydro-2(or 4)-methyl-, 1628^{8}.
o-Benzaniside, *N*-methyl-, 1080^{1}.
Benzoic acid, *p*-dimethylamino-, Ph ester, 371^{4}.
Benzophenone, *p*-ethoxy-, oxime, 2158^{8}.
Benzoxylide, hydroxy-, 2154^{8}, 2155^{1}.
Isonicotinic acid, 2-methyl-6-phenyl-, Et ester, 3296^{9}.
Nicotinic acid, 2-methyl-6-phenyl-, Et ester, 3296^{8}.
$C_{15}H_{15}NO_2S$ Acetanilide, tolylsulfinyl-, 3448^{6}.
$C_{15}H_{15}NO_3$ Benzamide, *N*-vanillyl-, 404^{8}.
Benzophenone, 4-hydroxy-3-methoxy-2'-methyl-, oxime, 402^{2}.
$C_{15}H_{15}NO_3S$ Acetanilide, *m*-(benzylsulfonyl)-, 1063^{1}.
—, tolylsulfonyl-, 3448^{7}.
$C_{15}H_{15}NO_4$ Desiodothyroxin, 2506^{6}.
$C_{15}H_{15}NO_4S$ Acetophenone, α-(*p*-anisylsulfonyl)-, oxime, 419^{9}.
$C_{15}H_{15}NO_5$ Ether, *m*(and *p*)-methoxybenzyl 4(and 5)-nitro-*o*-anisyl, 1608^{8}.
Indole, 1-acetyl-3-(dihydroxymethyl)-, diacetate, 758^{7}.
Propionic acid, α-(nitronaphthoxy)-, Et ester, 1617^{9}, 1618^{1,3}.
$C_{15}H_{15}N_3O$ Hydrazine, α-(α-amino-*o*-hydroxycinnamal)-β-phenyl-, 3291^{7}.
α-Toluhydroxamamide, *N*-*p*-tolylimino-, 415^{5}.
$C_{15}H_{15}N_3OS$ Anisaldehyde, 4-phenylthiosemicarbazone, 416^{8}.
$C_{15}H_{15}N_3O_2$ Anthranilic acid, *N*-methyl-, β-benzoylhydrazide, 207^{1}.
Methyl red, 175^{1}.
p-Toluidine, *N*-[α-(*m*-nitrophenylimino)ethyl]-, 1799^{4}.
$C_{15}H_{15}N_3O_3S$ Sulfanilic acid, *N*-acetyl-, benzalhydrazide, 1409^{4}.
$C_{15}H_{15}N_3O_4$ *o*-Veratraldehyde, *p*-nitrophenylhydrazone, 1065^{9}.
$C_{15}H_{15}N_3O_7S$ *p*-Toluenesulfono-*p*-phenetide, 3,2'-dinitro-, 400^{1}.
$C_{15}H_{15}N_3S$ Benzaldehyde, thio-4-*p*-tolylsemicarbazone, 2161^{9}.
$C_{15}H_{15}N_5O$ 2-Naphthol, (5-isopropyl-3-*s*-triazolylazo)-, 3294^{1}.
$C_{15}H_{16}BrN_3O_2$ 2-Pyrrolecarboxylic acid, 4-bromo-5-formyl-3-methyl-, Et ester, phenylhydrazone, 2160^{4}.
$C_{15}H_{16}IN_3S$ Methylene azure B, iodide, 1240^{3}.
$C_{15}H_{16}N_2$ Toluidine, *N*-(α-anilinoethylidene)-, 1799^{4}.
$C_{15}H_{16}N_2O$ Acetophenone, *p*-anisylhydrazone, 598^{4}.
—, *p*-methoxy-, phenylhydrazone, 598^{4}.
Carbanilide, *o,o'*(and *p,p'*)-dimethyl-, 2660^{9}.
2,3,4-Hemimellitenol, phenylazo-, 1602^{1}.
Urea, α-methylbenzyl-β-phenyl-, 371^{9}.
—, α-phenethyl-β-phenyl-, 372^{1}.
$C_{15}H_{16}N_2O_3$ 5-Pyrimidinecarboxylic acid, 2-*p*-anisyl-4-methyl-, Et ester, 206^{4}.
$C_{15}H_{16}N_2O_4$ Barbituric acid, 5-phenacyl-5-propyl-, 3601^{9}.
1,2,6-Isodiazine, 2-acetyl-3-(2,5-cresyl)-5-methyl-, acetate, 1412^{8}.

$C_{15}H_{16}N_2O_5$ 3-Hydantoinacetic acid, 5-anisal-, Et ester, 367[4].
—, 5-anisalmethyl-, Me ester, 367[1].
$C_{15}H_{16}N_2S$ Carbanilide, *m,m'*(*o,o'* and *p,p'*)-dimethyl-, 2313[9].
$C_{15}H_{16}N_4$ *s*-Tetrazine, 1,2,3,4-tetrahydro-4-phenyl-6-*p*-tolyl-, 1084[9].
$C_{15}H_{16}N_4O_4$ Caffeine benzoate, 1030[7].
$C_{15}H_{16}N_4O_5$ Caffeine salicylate, 1030[7].
$C_{15}H_{16}N_4O_7$ Phenethylamine, methyl-, picrate, 1794[5,6].
Picoline, isopropyl-, picrate, 2501[7]
$C_{15}H_{16}N_4O_7S$ Aniline, *p*-(ethylmercapto)-N-methyl-, picrate, 371[7]
$C_{15}H_{16}N_6$ 2-Naphthylamine, (5-isopropyl-3-s-triazolylazo)-, 3294[1]
—, (5-propyl-3-*s*-triazolylazo)-, 3294[1]
$C_{15}H_{16}O$ *p*-Cresol, 2-phenethyl-, 718[8].
Ether, benzyl 2,4-xylyl-, 718[4]
—, methyl 1,2,3,4-tetrahydro-9-anthryl, 1404[1].
$C_{15}H_{16}O_2$ Anisyl alcohol, *α*-benzyl-, 2324[7].
Hydrobenzoin, *α*-methyl-, 2821[8]
Methane, (2,4-dimethoxyphenyl)phenyl-, 2849[1].
Resorcinol, (phenylpropyl)-, 2320[5], 3163[6].
$C_{15}H_{16}O_3$ Cyclohexanone, 2-(hydroxymethylene)-4-methyl-, benzoate, 389[1].
Ether, *o*-anisyl *m*(and *p*) methoxybenzyl, 1608[6].
Hydrobenzoin, *p*-methoxy-, 2324[6,7].
Phloroglucinol, phenylpropyl-, 3163[7].
Propionic acid, *α*-1(and 2)-naphthoxy-, Et ester, 1617[8,9], 1618[1]
$C_{15}H_{16}O_4$ 3-Furancarboxylic acid, 3-ethyl-2,3-dihydro-2-keto-5-phenyl-, Et ester, 401[7].
$C_{15}H_{16}O_5$ 1,2-Benzopyran-3-carboxylic acid, 6,8$_1$-dihydro-2,6-diketo-5,7,8-trimethyl-, Et ester, 2320[6].
—, 2-keto-6-methoxy-5,7,8-trimethyl-, Me ester, 2320[7]
$C_{15}H_{16}O_8$ Acetophenone, 3,4,5-trihydroxy-*α*-methoxy-, triacetate, 3457[4].
$C_{15}H_{16}O_9$ Daphnin, 1070[1].
$C_{15}H_{17}As$ Arsine, methylphenethylphenyl-, 2839[4].
$C_{15}H_{17}AsN_2O_4$ Arsanilic acid, *N*-(3-amino-4-ethoxybenzoyl)-, *and salts*, 394[6].
$C_{15}H_{17}BrN_2O_2$ 2-Pyrrolecarboxylic acid, 5-(anilinomethyl)-4-bromo-3-methyl-, Et ester, 2160[5].
Trimethyl[*p*-(*p*-nitrophenyl)phenyl]ammonium bromide, 586[9].
$C_{15}H_{17}Br_3N_2O_2$ Trimethyl[*p*-(*p*-nitrophenyl)phenyl]ammonium tribromide, 586[8].
$C_{15}H_{17}IN_2O_2$ Trimethyl[*p*-(*p*-nitrophenyl)phenyl]ammonium iodide, 586[9].
$C_{15}H_{17}N$ Dibenzylamine, *N*-methyl-, 1603[4].
$C_{15}H_{17}NO$ Benzohydrol, *α*-(*α*-aminoethyl)-, 2324[9].
Benzohydrylamine, *p*-ethoxy-, 1400[4]; *and* -*HCl*, 2158[4,5,6].
Phenethylamine, *α*-(*p*-anisyl)-, 1400[6]; -*HCl*, 2158[9].
$C_{15}H_{17}NO_2$ Carbazolecarboxylic acid, 5,6,7,8-tetrahydro-, Et ester, 2326[7].
$C_{15}H_{17}NO_2S$ *p*-Toluenesulfonamide, *N*-methyl-benzyl-, 371[9], 372[1].
$C_{15}H_{17}NO_4$ Compd., m. 61°, from oxime of naphthazarin, 1078[1].
$C_{15}H_{17}NS$ Valeramide, *N*-2-naphthylthio-, 364[1].
$C_{15}H_{17}N_3O_2$ 3-Pyrrolecarboxylic acid, 5-formyl-4-methyl-, ethyl ester, phenylhydrazone, 3455[9].
$C_{15}H_{17}N_3O_3$ Compd. from 4-hydrazinopyridine and Et acetoacetate, m. 165°, 1807[6].
$C_{15}H_{17}N_3O_5$ Trimethyl[*p*-(*p*-nitrophenyl)phenyl]-ammonium nitrate, 586[8].
$C_{15}H_{17}N_5O_7$ Indazole, 4,5,6,7-tetrahydro-dimethyl-, picrate, 389[3,7].
$C_{15}H_{17}N_5O_9$ 5-Pyrazolecarboxylic acid, 1-ethyl-3-methyl-, Et ester, picrate, 2494[5].
2-Pyrrolecarboxylic acid, 4-amino-3,5-dimethyl-, Et ester, picrate, 1235[9].
$C_{15}H_{18}$ Azulene, 1226[9].
Cadalene, 752[4].
Chamazulene, 1227[1].
Eucazulene, 1227[2].
Guaiazulene, 1227[2]
Tricyclopentadiene, 2148[6].
$C_{15}H_{18}AsI$ Dimethylphenyl-*p*-tolylarsonium iodide, 393[3].
$C_{15}H_{18}BrN$ Trimethyl(*p*-phenylphenyl)ammonium bromide, 586[7].
$C_{15}H_{18}Br_3N$ Trimethyl(*p*-phenylphenyl)ammonium tribromide, 586[8].
$C_{15}H_{18}ClN$ Benzyldimethylphenylammonium chloride, 3695[4].
$C_{15}H_{18}ClNO_4$ Trimethyl(*p*-phenylphenyl)ammonium perchlorate, 586[8].
$C_{15}H_{18}IN$ Trimethyl(*p*-phenylphenyl)ammonium iodide, 586[8].
$C_{15}H_{18}N_2$ Aniline, *p,p'*-isopropylidenebis-, I 3697[1]
Ethylenediamine, *N*-benzyl-*N'*-phenyl-, 1623[9].
Indazole, 2-benzyl-4,5,6,7-tetrahydro-5-methyl-, 389[5].
—, 4,5,6,7-tetrahydro-4,6-dimethyl-2-phenyl-, *and perchlorate*, 389[3].
Isoindazole, 4,5,6,7-tetrahydro-4,6-dimethyl-1-phenyl-, *and perchlorate*, 389[5].
$C_{15}H_{18}N_2O$ Urea, *α,α*-diethyl-*β*-1-naphthyl-, 2319[5].
$C_{15}H_{18}N_2O_3$ 2,5-Pyrrolopyrazine-1,4-dione, 2,3,6,7,8,8$_1$-hexahydro-3-*p*-methoxybenzyl-, 3169[8].
Trimethyl(*p*-phenylphenyl)ammonium nitrate, 586[8].
$C_{15}H_{18}N_2O_4S_2$ 1,3-Propanedisulfonanilide, 913[8].
$C_{15}H_{18}N_2O_5$ 3-Hydantoinacetic acid, 5-*p*-hydroxybenzyl-*α*-methyl-, Et ester, 366[8].
$C_{15}H_{18}O$ Butyrophenone, cyclopentenyl-, 3447[7].
Propiophenone, cyclohexenyl-, 3447[5].
$C_{15}H_{18}O_2$ Anthraquinone, 1,2,3,4,5,6,7,8-octahydro-2-methyl-, 1405[4].
$C_{15}H_{18}O_3$ Linderaic acid, 2679[2].
$C_{15}H_{18}O_4$ Benzoic acid, *m*-(*β*-acetyl-*γ*-hydroxy-Δ^γ-butenyl)-, Et ester, 2843[3].
—, *o*-(*β*-acetyl-*γ*-ketobutyl)-, Et ester, 2843[4]
—, *m*-[*β*-(*α*-hydroxyethylidene)-*γ*-ketobutyl]-, 2843[4].
Malonic acid, *p*-methylbenzal-, di-Et ester, 1079[1].
$C_{15}H_{18}O_5$ Malonic acid, anisal-, di-Et ester, 1078[9].
$C_{15}H_{18}O_6$ Malic acid, di-Et ester, benzoate, 1056[7].
Malonic acid, (2,5-dimethoxy-3,4,6-trimethylbenzal)-, *and Ag salt*, 2320[8]
Trimesic acid, tri-Et ester, 207[9].
$C_{15}H_{19}N$ Cyclopentanenitrile, 2,2,3-trimethyl-3-phenyl-, 2158[1].
$C_{15}H_{19}NO$ Cyclohexanone, 2-(anilinomethylene)-3,5-dimethyl-, 389[6].
$C_{15}H_{19}NO_2$ See *Tropacocaine*.

$C_{15}H_{19}NO_3S$ Trimethylphenylammonium benzenesulfonate, 1795^{5}.
$C_{15}H_{19}NO_5$ Aspartic acid, *N*-benzoyl-, di-Et ester, 1056^{8}.
$C_{15}H_{19}N_3O$ Acetophenone, cyclohexenyl-, semicarbazone, 3447^{4}.
$C_{15}H_{19}N_3O_4S$ 2-Acetamido-6-amino-1-methylpyridinium *p*-toluenesulfonate, 3009^{4}.
$C_{15}H_{19}N_3O_5$ Isobutyric acid, [*N*-(*N*-benzoylglycyl)glycylamino]-, 3299^{2}.
$C_{15}H_{20}BrNO_4$ Serine, *N*-(α-bromoisocaproyl)-β-phenyl-, 3450^{9}.
$C_{15}H_{20}Br_2O_4$ Veratrole, 4-bromo-3-(β-bromopropoxypropyl)-5,6-methylenedioxy-, 3450^{2}.
$C_{15}H_{20}N_2$ Isopyrrole, 5-ethyl-2-(5-ethyl-3-methyl-2-pyrrylmethylene)-3-methyl-, *perchlorate*, 1236^{4}.
Δ^{2}-Pyrazoline, 3-isobutenyl-5,5-dimethyl-1-phenyl-, 761^{8}.
$C_{15}H_{20}N_2O$ 1(2)-Naphthalenone, 3,4-dihydro-2-(1-piperidyl)-, oxime, 383^{2}.
$C_{15}H_{20}N_2O_4$ Cyclohexanol, 2-dimethylamino-, *p*-nitrobenzoate, *and -HCl*, 2831^{7}.
Isobutyric acid, heptamethylenebis[α-amino-, 1961^{6}.
$C_{15}H_{20}N_4$ Hydrazine, *p*,*p*′-methylenebis[α-methyl-α-phenyl-, 904^{2}.
$C_{15}H_{20}N_4O_4S_2$ 1,3-Propanedisulfonic acid, bisphenylhydrazide, 913^{8}.
1,3-Propanedisulfonanilide, *o*,*o*′-diamino-, 913^{8}.
$C_{15}H_{20}N_4O_{10}$ Nipecotic acid, 4-hydroxy-1,4-dimethyl-, Me ester, picrate, 1810^{5}.
$C_{15}H_{20}O_2$ 9,10-Anthradiol, 1,2,3,4,5,6,7,8-octahydro-2-methyl-, 1405^{4}.
Ketone, b$_{1}$ 118°, from caryophyllene, 1073^{2}.
Δ^{1}-3-Nonenone, 1-salicyl-, 387^{2}.
$C_{15}H_{20}O_6$ Malonic acid, (2,5-dimethoxy-3,4,6-trimethylbenzyl)-, 2320^{6}.
$C_{15}H_{20}O_7S$ Malic acid, di-Et ester, *p*-toluenesulfonate, 1056^{2}.
$C_{15}H_{21}N$ Hydrocinnamonitrile, α-hexyl-, 2657^{1}.
$C_{15}H_{21}NO_2$ (See also *β-Eucaine.*)
Cyclohexanol, 2-dimethylamino-, benzoate, *and -HCl*, 2831^{7}.
Cyclopentanepropanol, carbanilate, 1598^{9}.
$C_{15}H_{21}NO_4$ Benzoic acid, nitro-, α-methylheptyl ester, 3451^{2}.
$C_{15}H_{21}NO_6$ Carbanilic acid, *o*-carbopropoxyoxy-, Bu ester, 2319^{9}.
$C_{15}H_{21}NO_6S$ Aspartic acid, *N*-*p*-tolylsulfonyl-, di-Et ester, 1056^{9}.
$C_{15}H_{21}N_3O_2$ See *Physostigmine.*
$C_{15}H_{21}N_3O_3$ See *Geneserine.*
$C_{15}H_{21}N_7O_5$ Guanidine, α-ethyl-β,γ-dimethyl-, picrolonate, 3284^{7}.
$C_{15}H_{22}$ Tricyclopentadiene, tetrahydro-, 2148^{7}.
$C_{15}H_{22}N_2O_2$ Cyclohexanol, 2-dimethylamino-, *p*-aminobenzoate, *and salts*, 2831^{8}.
$C_{15}H_{22}N_2O_4$ Serine, *N*-leucyl-β-phenyl-, 3450^{9}.
$C_{15}H_{22}N_2O_5S$ Glycine, *N*-(*N*-tolylsulfonylleucyl)-, 3298^{9}.
Leucine, *N*-(*N*-tolylsulfonylglycyl)-, 3298^{8}.
$C_{15}H_{22}N_2O_{10}$ *d*-Glucose, ureide, tetraacetate, 1596^{1}.
$C_{15}H_{22}N_4O_4$ Acanthine, 2025^{5}.
$C_{15}H_{22}N_4O_9$ Valine, Bu ester, picrate, 1055^{9}.
$C_{15}H_{22}N_6O_2$ Δ^{2}-Cyclohexenone, 3-methyl-5-phenyl-, semicarbazide-semicarbazone, 3161^{2}.
$C_{15}H_{22}O$ Δ^{4}-2-Heptenol, 2,6-dimethyl-1-phenyl-, 3687^{2}.
$C_{15}H_{22}O_2$ Cumic acid, iso-Am ester, 1793^{5}.
Cyclohexanol, 4-(4-hydroxy-α,α-dimethylbenzyl)-, P 3697^{3}.
7-*p*-Cymenecarboxylic acid, Bu and isobutyl esters, 2488^{4,5}.
Valeric acid, *p*-isopropylbenzyl ester, 2488^{2}.
$C_{15}H_{22}O_3$ Camphor, 3-(hydroxymethyl)-, crotonate, 1228^{1}.
Cinnamaldehyde, α-ethoxy-, di-Et acetal, 759^{7}.
Pelargonophenone, 2,4-dihydroxy-, 2320^{2}.
$C_{15}H_{22}O_4$ Cyclohexanecarboxylic acid, 2-cyclohexyl-4,6-diketo-, Et ester, 3287^{7}.
Isohumulinic acid, 744^{3}.
$C_{15}H_{22}O_7$ 1,2,3-Cyclobutanetricarboxylic acid, 2-acetyl-, tri-Et ester, 49^{2}.
$C_{15}H_{22}O_{10}$ Galactoside, tetraacetylmethyl-, 1790^{4}.
Mannoside, tetraacetylmethyl-, 1790^{3,4}.
$C_{15}H_{23}N$ Aniline, *N*-butyl-*N*-(cyclobutylmethyl)-, 390^{5}.
Cyclohexylamine, 2-benzyl-*N*,*N*-dimethyl-, *and -HCl*, 2665^{9}.
Piperidine, 1-(α-ethyl-α-methylbenzyl)-, *and chloroplatinate*, 1053^{4}.
$C_{15}H_{23}NO$ Camphidone, 3-allyl-4-ethylidene-, 2999^{4}.
Hydrocinnamamide, α-hexyl-, 2657^{1}.
$C_{15}H_{23}NO_2$ 1-Butanol, 3-diethylamino-, benzoate, *-HCl*, 1788^{7}.
Butyraldehyde, β-benzalamino-, di-Et acetal, 1788^{5}.
Cyclohexylamine, 2-benzyl-, acetate, 2665^{7,9}.
Hydroxylamine, β,β-diisobutyl-, benzoate, *and bisulfate*, 372^{4}.
$C_{15}H_{24}$ Cadinene, 187^{2}; *and CrO_2Cl_2 addn. compd.*, 1073^{3}.
Caryophyllene, *and CrO_2Cl_2 addn. compd.*, 1072^{7}, 1073^{2}.
Cedrene, 187^{3}, 798^{2}; *and CrO_2Cl_2 addn. compd.* 1073^{3}.
Chamazulene, hexahydro-, 1227^{3}.
Guaiene, 1227^{2}.
Hydrocarbon, b$_{9}$ 114–8°, from cedrene and HCO_2H, 187^{2}.
Hydrocarbon, b$_{8}$ 118–24°, from cadinene and HCO_2H, 187^{2}.
Mitsubene, 1070^{7}, 2490^{4}.
Selenene, 752^{4}.
Sesquiterpene, b$_{10}$ 139–42°, 1987^{7}.
$C_{15}H_{24}Cl_2O$ Anhydride, b$_{1}$ 125–40°, from caryophyllene, 1073^{1}.
$C_{15}H_{24}IN$ 1,2,3,4-Tetrahydro-2-isobutyl-1,1-dimethylquinolinium iodide, 1082^{3}.
$C_{15}H_{24}N_2O$ (See also *Lupanine.*)
Urea, α,α-diisobutyl-β-phenyl-, 900^{1}.
$C_{15}H_{24}N_2O_2$ (See also *Isocaine.*)
Benzoic acid, *p*-amino-, β-dipropylaminoethyl ester, 1880^{1}; *-HCl*, 1852^{8}.
Lupanine, hydroxy-, 1865^{2}.
$C_{15}H_{24}N_4O_8$ 2-Butanol, 3-diethylamino-2-methyl-, picrate, 2820^{6}.
$C_{15}H_{24}O$ Ketone, b$_{1}$ 100–10°, from caryophyllene, 1073^{2}.
Ketone, b$_{0.15}$ 93°, from cedrene, 1073^{9}.
$C_{15}H_{24}O_2$ 2,3-Nonanediol, 2-phenyl-, 1786^{7}.
Resorcinol, 4-nonyl-, 2320^{8}.
$C_{15}H_{24}O_2S$ *p*-Toluenesulfinic acid, α-methylheptyl ester, 397^{1}.
$C_{15}H_{24}O_3$ Camphor, 3-(hydroxymethyl)-, butyrate, 1228^{1}; isobutyrate, 1227^{9}.
$C_{15}H_{24}O_6$ Malonic acid, bis(vinyloxyethyl)-, di-Et ester, 367^{7}.

$C_{15}H_{24}O_7$ 1,2,4 - Pentanetricarboxylic acid, 3-keto-4-methyl-, tri-Et ester, 2400[8].
$C_{15}H_{24}O_8$ Propanetetracarboxylic acid, tetra-Et ester, 50[6], 3689[9].
$C_{15}H_{25}Cl$ Caryophyllene, chlorodihydro-, 1073[1].
$C_{15}H_{25}N$ Pyridine, 2(and 4)-isobutyl-3,5 di-isopropyl-, 2499[4].
$C_{15}H_{25}NO$ Triethylamine, β-(α-ethoxybenzyl)-, *and* -*HCl*, 1604[9].
$C_{15}H_{25}N_3O_2$ 5 - Epicamphorcarboxylic acid, isopropyl ester, semicarbazone, 2674[9].
$C_{15}H_{26}$ Chamazulene, octahydro-, 1227[3].
Guaiazulene, octahydro-, 1227[3].
Guaiene, dihydro-, 1227[3].
$C_{15}H_{26}Br_2O$ Caryophyllol, dibromide, 1072[9].
$C_{15}H_{26}Cl_2O_2$ Dichlorohydrin(?) from caryophyllene and HOCl, 1073[1].
$C_{15}H_{26}Cl_2O_2Te$ 1,2 - Telluropyran - 3,5(4,6)-dione, 2-decyl-, 1,1-dichloride, 413[6].
$C_{15}H_{26}N_2$ (See also *Sparteine.*)
Pyridine, 2-butyl - 1,2 - dihydro-1-methyl-3(or 5)-(tetrahydro - 1 - methyl-2 pyrryl)-, 2863[2].
—, 2 - diisoamylamino-, and chloroplatinate, 3008[8], 3009[1].
$C_{15}H_{26}N_2O$ See *Oxysparteine.*
$C_{15}H_{26}O$ Carotol, 2845[9].
Caryophyllol, 1072[9], 3695[8].
Cedrol, 263[4], 798[4].
Eudesmol, 2720[4].
Sesquiterpene alc., b_{10} 170–4°, 1987[7].
$C_{15}H_{26}O_2$ Isovaleric acid, bornyl and isobornyl esters, 2998[5].
$C_{15}H_{26}O_2Te$ 1,2 - Telluropyran-3,5(4,6) dione, 2-decyl-, 413[6].
$C_{15}H_{26}O_3$ 1-Propanone, 3-hydroxy-1-(1,2,2,3-tetramethylcyclopentyl)-, propionate, 1399[7].
$C_{15}H_{26}O_4$ Cyclohexanepropionic acid, 1-(carboxymethyl)-, di-Et ester, 1060[9].
1,2 - Ethanediol, 1 - (1,2,2,3-tetramethylcyclopentyl)-, diacetate, 1399[8].
Malonic acid, cyclohexylethyl-, diethyl ester, 3160[2].
$C_{15}H_{26}O_5$ Malonic acid, butyl (β-vinyloxyethyl)-, di-Et ester, 367[1].
$C_{15}H_{26}O_6$ Butyrin, 610[9], 2658[4], 3736[9].
1,2,2-Hexanetricarboxylic acid, tri-Et ester, 3005[4].
Malic acid, di-Et ester, enanthate, 1056[8].
$C_{15}H_{27}NO_5$ Aspartic acid, *N*-enanthyl-, di-Et ester, 1056[9].
$C_{15}H_{28}IN$ Carbazole, dodecahydro - 3,9 - dimethyl-, methiodide, 913[8].
$C_{15}H_{28}INO_5$ Diacetoneglucosyl - 3 - tetramethylammonium iodide, 2663[1].
Galactosyl - 6 - dimethylamine, diacetone-, methiodide, 1597[3].
$C_{15}H_{28}N_4$ Isobutyronitrile, *N*, *N'*-heptamethylenebis[α-amino-, *and di-HCl*, 371[1].
$C_{15}H_{28}O$ Cyclopentadecanone, 1792[5], 2151[6].
$C_{15}H_{28}O_2$ Cyclohexanepelargonic acid, 3160[4].
Cyclohexanol, 4,4'-isopropylidenebis-, P 3007[3].
Glycol, m. 173°, from caryophyllene, 1072[9].
2,4-Pentadecanedione, 738[9].
$C_{15}H_{28}O_3$ Cyclohexanepelargonic acid, hydroxy-, 3160[4].
$C_{15}H_{28}O_4$ Brassylic acid, di-Me ester, 1789[3].
1,11-Hendecanediol diacetate, 1789[4].
1,9 - Nonanedicarboxylic acid, di-Et ester, 1789[2].
1,13 - Tridecanedicarboxylic acid, 1789[3].
$C_{15}H_{28}O_6$ Azelaic acid, α,η-dimethoxy-, di-Et ester, 2831[2].
Malonic acid, bis(propoxymethyl)-, di-Et ester, 581[9].
$C_{15}H_{29}NO$ Capric acid, piperidide, 2845[1].
$C_{15}H_{29}NO_4$ Propionic acid, β,β'-(amylimino)-bis-, di-Et ester, 3010[2].
—, β,β' - isoamyliminobis-, di-Et ester, 3010[2].
$C_{15}H_{29}N_3O$ Cyclotetradecanone, semicarbazone, 1792[5].
$C_{15}H_{29}N_3O_3$ Lauric acid, λ-formyl-, Me ester, semicarbazone, 1590[2].
$C_{15}H_{30}$ Cyclopentadecane, 2151[5].
$C_{15}H_{30}AsN_3$ Arsine, tripiperidyl-, *tri-HCl*, 3046[6].
$C_{15}H_{30}Br_2$ Pentadecane, 1,15-dibromo-, 1789[2].
$C_{15}H_{30}N_2O_4$ Isobutyric acid, *N*, *N'*-heptamethylenebis[α-amino-, *and Cu salt*, 371[1].
$C_{15}H_{30}O$ Pentadecylaldehyde, 362[7].
$C_{15}H_{30}O_3$ Convolvulinolic acid, 365[7].
$C_{15}H_{30}O_8$ Glycerol, hexamethylglucoside, 376[5].
$C_{15}H_{31}BrO$ 1-Pentadecanol, 15-bromo-, 1789[2].
$C_{15}H_{32}N_2O_3$ Betainogen, 2025[6].
Homocledonine, 2025[5].
$C_{15}H_{32}N_2S$ Urea, diheptylthio-, 2835[3].
$C_{15}H_{32}O_2$ 1,15-Pentadecanediol, 1789[1].
$C_{15}H_{32}O_5S_2$ *d*-Glucose, pentamethyldiethylmercapto-, 2987[5].
$C_{15}H_{33}N$ Dibutylamine, *N*-heptyl-, 3688[6].
$C_{16}HCl_{24}Fe_3O_{17}$, 1769[4].
$C_{16}H_7NO_4S$ Spiro[1,3 - benzodioxan - 2,1'-phthalan] 4,2'-dione, 6-thiocyano-, 182[8].
$C_{16}H_7N_5O_6$ 4,5 - α,β - Naphthotriazoledione, 7-nitro-2-(*p*-nitrophenyl)-, 2859[8].
$C_{16}H_8Br_3NO_2$ 1,4 - Naphthoquinone, 2-anilino-3,6,7-tribromo-, 1804[1].
$C_{16}H_8Br_4Se$ Selenophene, 2,4 diphenyl tetrabromo-, 592[5].
$C_{16}H_8Cl_2O_2$ $\Delta^{1,2'}$ (2,1') - Bi[benzofuran] - 2 - one, 4,4'-dichloro-, 1237[9].
$C_{16}H_9Br_3Se$ Selenophene, 2,4-diphenyl-, tribromo deriv., 592[5].
$C_{16}H_9ClO_4$ Anthraquinone, 1-chlorohydroxy-, acetate, 2853[8], 3453[4].
$C_{16}H_9Cl_2N_3O$ 4,5 - α,β - Naphthotriazoledione, 2-phenyl-, dichloro deriv., 2859[7].
$C_{16}H_9FeO_7$ Rhamnetin, Fe deriv., 405[9].
$C_{16}H_9NO_2$ 3,7 - *peri* - Naphthoquinoline-2(3),7-dione, 398[1].
$C_{16}H_9N_3O_2$ 4,5 - β,α - Isonaphthotriazoledione, 3-phenyl-, 2859[3].
4,5 - α,β - Naphthotriazoledione, 2-phenyl-, 2859[4].
$C_{16}H_{10}Br_2Se$ Selenophene, 2,4 diphenyl-, dibromo deriv., 592[4].
$C_{16}H_{10}Br_3NO_3$ 1,4-Naphthoquinone, 2,6,7-tribromo-3-hydroxy-, $PhNH_2$ salt, 1803[9].
$C_{16}H_{10}ClNO$ Cinchoninyl chloride, 2-phenyl-, -*HCl*, 2857[4].
$C_{16}H_{10}ClNO_2$ Oxazinone, (chlorophenyl)phenyl-, 3168[9].
$C_{16}H_{10}ClN_3O_2Se$ 1 - (2-Naphthyl)-4-nitropiaselenolium chloride, 2498[7].
$C_{16}H_{10}Cl_2O_2$ 9-Anthrol, 2,3-dichloro-, acetate, 3166[4].
$C_{16}H_{10}Cl_2O_3$ Anthrone, 4,5-dichloro-10-hydroxy-, acetate, 2492[9].
$C_{16}H_{10}CuN_4O_4$ 1,2,4-Oxdiazol - 5(4) - one, 3-phenyl-, Cu deriv., 2822[6].
$C_{16}H_{10}Mn_2N_4O_{12}$, 720[2].
$C_{16}H_{10}N_2O$ Isocyanic acid, 2-phenyl-4-quinolyl ester, 3010[8].
$C_{16}H_{10}N_2O_2$ See *Indigotin*.

$C_{16}H_{10}N_2O_3$ Compd., m. 314°, from 2-hydrazino - 3 - hydroxyanthraquinone, 757[9].
$C_{16}H_{10}N_2O_4$ Cinchophen, 6-nitro-, 397[1].
8-Quinolinol, *p*-nitrobenzoate, 399[5].
$C_{16}H_{10}N_2O_5$ Ether, 2,4-dinitro - 1 - naphthyl phenyl, 2666[6].
$C_{16}H_{10}N_2O_{14}S_4$ Indigotintetrasulfonic acid, *tetra-K salt*, 742[4].
$C_{16}H_{10}N_2S_2$ Quinrhodine, 3-phenyl-, 1627[5].
$C_{16}H_{10}N_4O$ Cinchoninyl azide, 2-phenyl-, 3010[9].
$C_{16}H_{10}N_4O_2$ 4,5 - αβ - Naphthotriazoledione, 2-phenyl-, monoxime, 2860[3].
$C_{16}H_{10}OS$ 3,2-α Anthrathiophen-1(2) - one, P 3460[7].
$C_{16}H_{10}O_6$ Anthragallol, 3-acetate, 3453[4].
Anthrapurpurin, 2-acetate, 3453[3].
$C_{16}H_{11}Br$ Naphthalene, 1-phenyl-, bromination product, 1401[5].
$C_{16}H_{11}BrHgSe$ Selenophene, 2-(bromomercuri)-3,5-diphenyl-, 592[5].
$C_{16}H_{11}BrN_2O_3$ Barbituric acid, 5-bromo-1,3-diphenyl-, *N_2H_4 salt*, 2825[9].
$C_{16}H_{11}BrN_2O_5S$ Cinnamonitrile, α (*p* - bromophenylsulfonyl) - 3 - methoxy - 2(and 4)-nitro, 402[8, 9].
$C_{16}H_{11}BrN_4O_7$ Quinoline, 2-bromo-6-methyl-, picrate, 205[4].
$C_{16}H_{11}BrOS$ Thioflavone, 3-bromo 6-methyl-, 197[7].
$C_{16}H_{11}BrO_3S$ Thioflavone, 3-bromo-6-methyl-, *S*-dioxide, 199[3].
$C_{16}H_{11}Br_3$ Anthracene, 2,3,9 tribromo-10-ethyl-, 3003[7].
$C_{16}H_{11}Br_3OS$ Thioflavone, 3-bromo-6-methyl-, dibromide, 198[7].
$C_{16}H_{11}ClHgN_2O_4S$ 1-Naphthalenesulfonic acid, 4 - (3 - chloromercuri - 4 - hydroxyphenylazo)-, *Na salt*, 1605[4].
$C_{16}H_{11}ClN_2O_5S$ Cinnamonitrile, α-(*p*-chlorophenylsulfonyl) - 3 - methoxy-2(and 4)-nitro-, 402[8, 9].
$C_{16}H_{11}ClO_2$ 9-Anthrol, 1(and 4)-chloro, acetate, 1078[3].
Coumarin, 6 chloro - 4 - methyl-3-phenyl-, 1238[2].
Isoflavone, 6-chloro-2-methyl-, 1237[7].
$C_{16}H_{11}Cl_2NO_4$ 9 - Anthrol, 2,3-dichloro-9,10-dihydro-9(or 10)-nitro-, acetate, 3166[9].
$C_{16}H_{11}CuNO_6$ Piperonyloin, oxime, Cu deriv., 1055[7].
$C_{16}H_{11}HgISe$ Selenophene, 2-(iodomercuri)-3,5-diphenyl-, 592[6].
$C_{16}H_{11}NO$ 2(1) - Naphthalenone, 1 phenylimino-, 190[9].
$C_{16}H_{11}NO_2$ (See also *Cinchophen.*)
Cinchoninic acid, phenyl-, 479[5].
Naphthalene, 1-phenyl-, nitration product, 1401[4].
1,4 - Naphthoquinone, 2-anilino-, 2308[8]
1,4 - Naphthoquinonimine, 2-hydroxy-*N*-phenyl-, 191[1], 2308[8].
$C_{16}H_{11}NO_3$ Cincophen, 3-hydroxy-, *and Ba salt*, 205[2].
5-Isoxazolecarboxylic acid, 3,4-diphenyl-, 2327[2].
$C_{16}H_{11}NO_4S$ 2-Naphthol, 1-nitroso-, benzenesulfonyl deriv., 2331[3].
$C_{16}H_{11}NO_5S$ Metanilic acid, *N*-(3-hydroxy 4(1) - keto - 1 - naphthylidene)-, 2308[8].
Naphthalenesulfonic acid, anilinodihydrodiketo-(?), 2308[9].
$C_{16}H_{11}NO_8S_2$ Naphthalenedisulfonic acid, anilinodihydrodiketo-(?), 2308[7].
$C_{16}H_{11}N_2NaO_4S$ Orange II, *$NaHSO_3$ addn. compd.*, 195[8].
$C_{16}H_{11}N_3$ α-Benzophenazine, 10-amino-, 195[7].
$C_{16}H_{11}N_3O_2$ 4,5 - αβ - Naphthotriazolediol, 2-phenyl-, 2859[6].
$C_{16}H_{11}N_3O_3S$ αβ - Naphthotriazole-5-sulfonic acid, 2-phenyl-(?), *Na salt*, 195[7].
$C_{16}H_{11}N_3O_4$ 1,2,3 - Triazole-4-*o*-benzoic acid, 5-carboxy-1-phenyl-, 2859[4].
$C_{16}H_{11}N_3O_6$ 3-Isoquinolinecarboxylic acid, 1,2-dihydro-1-keto-2-(*p*-nitroanilino)-, 1803[3].
$C_{16}H_{11}N_3O_6S$ *p*-Nitrobenzenediazonium 2-naphthol-1-sulfonate, 1802[8].
$C_{16}H_{11}N_5O_2$ 4,5 - αβ - Naphthotriazoledione, 7 - amino - 2 - (*p*-aminophenyl)-, 2859[9].
$C_{16}H_{11}N_5O_3S$ Benzenesulfonyl azide, *p*-(2-hydroxy-1 naphthylazo)-, 1409[9].
$C_{16}H_{11}N_5O_7$ 3 - Indoleacetonitrile, picrate, 759[1].
$C_{16}H_{12}$ Naphthalene, 1-phenyl-, 1401[4].
$C_{16}H_{12}AsNO_5$ Cinchophen, 6-arsono-, 397[2].
$C_{16}H_{12}BrClO_3$ Propionic acid, bromo(chlorobenzoyl)phenyl-, 3168[6].
$C_{16}H_{12}BrN$ Lepidine, 6-bromo 2-phenyl-, 418[9].
$C_{16}H_{12}BrNO_2S$ Quinaldine, 3-(*p*-bromophenylsulfonyl), 1626[4].
$C_{16}H_{12}Br_2$ Anthracene, 9,10-bis(bromomethyl)-, 3003[8].
$C_{16}H_{12}Br_2OS$ Thioflavanone, 3,3-dibromo 6-methyl, 197[7], 198[4].
Thioflavone, 6 methyl-, dibromide, 197[7].
$C_{16}H_{12}Br_2O_3S$ Thioflavanone, dibromo-6-methyl-, *S*-dioxide, 199[1, 8].
$C_{16}H_{12}Br_2O_4$ Propionic acid, α,β-dibromo-β-*p*-phenoxybenzoyl-, 593[4].
$C_{16}H_{12}Br_4OS$ Thioflavanone, 3,3-dibromo-6 methyl, tetrabromide, 198[7].
$C_{16}H_{12}ClN$ Lepidine, 6(and 8)-chloro-2-phenyl, 418[3, 9]
$C_{16}H_{12}ClNO$ Propionitrile, chlorobenzoylphenyl, 3168[4].
$C_{16}H_{12}ClNO_2S$ Quinaldine, 3-(*p*-chlorophenyl sulfonyl), 1626[5].
$C_{16}H_{12}ClN_5O_7$ Imidazole. 5-chloro-2-methyl 1-phenyl-, picrate, 1624[2].
$C_{16}H_{12}Cl_2O_2$ Anthrone, dichloroethoxy-, 755[4], 2492[8].
$C_{16}H_{12}IN$ Lepidine, 6-iodo-2-phenyl-, 418[9].
$C_{16}H_{12}KNO$ Quinolinol, 4-methyl-2-phenyl, K deriv., 418[6, 7].
$C_{16}H_{12}NNaO$ Quinolinol, 4-methyl-2-phenyl-, Na deriv., 418[6, 7].
$C_{16}H_{12}N_2$ α,α'-Bi-*o*-tolunitrile, 1230[9].
Quinoline, 4 methyleneamino - 2 - phenyl-, 3011[1].
$C_{16}H_{12}N_2O$ Cinchoninaldehyde, 2-phenyl-, oxime, 2857[4].
2-Naphthol, 1,4 - dihydro-1 imino-4-phenylimino-, 2159[6].
Propiolic acid, phenyl-, benzalhydrazide, 2157[2].
Quinoline, 4 formamido-2-phenyl-, 3010[9].
$C_{16}H_{12}N_2OS_2$ Rhodanine, 5-(anilinomethylene)-3-phenyl-, 600[6].
$C_{16}H_{12}N_2O_2$ Cinchophen, 6-amino-, 397[1].
s-Maleimide, anilino-*N*-phenyl-, 1789[4].
2 Naphthol, 1 - (*p*-hydroxyphenylazo)-, 1393[7].
4 - Pyrazolecarboxylic acid, diphenyl-, 2495[4, 8].
5 - Pyrimidinecarboxylic acid, 4-methyl-2-(2-naphthyl)-, 206[9].
$C_{16}H_{12}N_2O_4$ Isatide, 3455[9].
Melilotonitrile, *p*-nitrobenzoate, 3291[6].

Naphthalic acid, cyclic diacetylhydrazide, 1075[3].
2,8-Phenazinediol, diacetate, 603[6].
$C_{16}H_{12}N_2O_5S$ Cinnamonitrile, 3(and 5)-hydroxy-4(and 2)-nitro-α-p-tolylsulfonyl-, 402[7].
$C_{16}H_{12}N_2O_6S$ Cinnamonitrile, α-(o-anisylsulfonyl)-3-hydroxy-4-nitro-, 402[7].
$C_{16}H_{12}N_2S_2$ p-Tolunitrile, α,α'-dithiobis-, 905[3].
$C_{16}H_{12}N_4O_4$ 4(3) - Quinazolone, 3-acetamido-2-(m-nitrophenyl)-, 206[8].
$C_{16}H_{12}N_4O_6$ Indole, 2,3-dimethyl-1-picryl, 598[5].
$C_{16}H_{12}N_4O_8$ Guaiacol, trinitro-, quinoline salt, 1395[1], 3449[9].
Quinoline, 3 methoxypicrate, 1394[9]
$C_{16}H_{12}N_4O_9$ 3-Indoleacetic acid, picrate, 759[2].
$C_{16}H_{12}N_6O_8$ 1 - Pyrazolecarboxamide, 3 phenyl, picrate, 760[6].
$C_{16}H_{12}N_6O_9$ Imidazole, 1 methyl 2-(p-nitrophenyl)-, picrate, 395[4]
$C_{16}H_{12}OS$ 4-Thiochromanone, 3-benzal, 198[5].
$C_{16}H_{12}O_2$ Acrylophenone, β-hydroxy-, benzoate, 3006[1].
Anthraquinone, 1,3(and 1,4) dimethyl-, 2852[7].
$C_{16}H_{12}O_3$ Coumarin, 6-hydroxy-4-methyl-3 phenyl-, 595[8].
Flavone, 4'-methoxy-, 2162[8].
Isoflavone, 7 hydroxy-2-methyl-, 196[6].
Isoflavone, 7 methoxy, 196[8].
1,4 - α - Naphthopyrone, 3 acetyl-2 methyl-, 1237[2].
Umbelliferone, 4 benzyl, 196[7]
, 4 methyl 3-phenyl-, 595[6].
$C_{16}H_{12}O_3S$ Naphthalenesulfonic acid, phenyl (?), Na salt, 1401[6].
Thioflavone, 6 methyl, S dioxide, 199[2].
$C_{16}H_{12}O_4$ Acrylic acid, β p phenoxybenzoyl, 593[8].
1,10 - Anthracenedione, 9 ethoxy 4-hydroxy, 2853[8].
Coumarin, 7,8 dihydroxy-4 methyl 3 phenyl, 595[7]
9 - Fluorenecarboxylic acid, 9-hydroxy, acetate, 2675[8]
Isoflavone, dihydroxymethyl, 196[7], 197[2].
2 Xanthenecarboxylic acid, 9-keto-, Et ester, 392[3].
$C_{16}H_{12}O_5$ Anthraquinone, 1 hydroxy-2,7-dimethoxy-, 411[7]
1,7 - Benzodi - 1,4 - pyran 4,10-dione, 9 acetyl-2,8-dimethyl-, 1237[6].
$C_{16}H_{12}O_{12}S_4Se$ Selenophene, 2,4 diphenyl, tetrasulfo deriv., 592[5].
$C_{16}H_{12}Se$ Selenophene, 2,4-diphenyl, 592[4].
$C_{16}H_{13}Br$ Anthracene, 9 bromo 10-ethyl-, 3003[7].
$C_{16}H_{13}BrN_2$ Pyrazole, 4-bromo 5 methyl-1,3-diphenyl, 2495[1].
$C_{16}H_{13}BrN_2O_3S$ Quinoline, 2-amino 3-(p bromophenylsulfonyl)-8 methoxy-, 402[9].
$C_{16}H_{13}BrOS$ Thioflavanone, 3-bromo 6-methyl-, 198[4].
$C_{16}H_{13}BrO_3S$ Thioflavanone, 3 bromo-6-methyl-, S-dioxide, 198[2].
$C_{16}H_{13}BrO_5$ Propiophenone, β (2 bromo-4,5-methylenedioxyphenyl) - 2,4 - dihydroxy-, 2679[9].
$C_{16}H_{13}Br_2N_3O_7$ Hydroxylamine, β,β bis(2 bromo - 5 - nitrophenacyl), dioxime, 1230[3].
$C_{16}H_{13}Br_5$ Anthracene, 1,2,3,4,9 - pentabromo 10-ethyl-1,2,3,4-tetrahydro-, 3003[7].
$C_{16}H_{13}ClN_2O_3S$ Quinoline, 2-amino-3-(p-chlorophenylsulfonyl)-6-methoxy-, 402[8,9].
$C_{16}H_{13}ClO_3$ Propionic acid, (chlorobenzoyl)-phenyl-, 3168[6].
$C_{16}H_{13}ClO_4$ 7-Hydroxy - 2 - (p-hydroxyphenyl)-3-methoxybenzopyrylium chloride; and $FeCl_3$ compd., 3297[6].
Propionic acid, (chlorobenzoyl)hydroxy - phenyl-, 3168[3].
$C_{16}H_{13}ClO_5 + 0.25H_2O$ 2 - (3,4 - Dihydroxyphenyl) - 3,7 - dihydroxy - 5 - methylbenzopyrylium chloride, 3456[9].
$C_{16}H_{13}ClO_6$ 2 - (2,4 - Dihydroxyphenyl)-5,7-dihydroxy - 3 - methoxybenzopyrylium chloride, 3457[2].
5 - (or 7) - Hydroxy - 7(or 5) - methoxy-2-(3,4,5 - trihydroxyphenyl)benzopyrylium chloride, 3457[4].
Peonidin chloride, 3457[5].
$C_{16}H_{13}ClO_7 + 2H_2O$ 5,7-Dihydroxy-3-methoxy-2-(3,4,5 - trihydroxyphenyl)benzopyrylium chloride, 3457[4].
$C_{16}H_{13}Cl_3O_2$ Phenethyl alcohol, α-(trichloromethyl), benzoate, 1218[1].
$C_{16}H_{13}N$ Lepidine, 2-phenyl-, 1991[7].
Naphthalene, 1-phenyl-, amino deriv., and -HCl, 1401[5].
$C_{16}H_{13}NO$ 2-Naphthol, 1-anilino, 190[9].
Oxindole, benzalmethyl-, 3456[2].
p Propiolotoluide, 2157[4].
Quinolinol, 4 methyl 2-phenyl-, 418[6]; and salts, 418[6,7].
$C_{16}H_{13}NOS$ 6 Quinolinol, 5-(p-tolylmercapto)-, 3289[7].
2(1) Quinolone, 3-(benzylmercapto)-, 1627[4].
$C_{16}H_{13}NO_2$ Compd. from 2-(β bromoethyl)-3-hydroxy 3 - phenylphthalimidine, m. 148[9], 1408[3].
Formanilide, p-(β-benzoylvinyl)-, and salts, 2156[3].
$C_{16}H_{13}NO_2S$ Quinaldine, 3-(phenylsulfonyl)-, 1626[1].
$C_{16}H_{13}NO_3$ Benzoic acid, m-cinnamylamino-, 398[1].
2 - Furancarbinol, 1-naphthalenecarbamate, 1232[9].
$C_{16}H_{13}NO_3S$ Carbostyril, 3-p-tolylsulfonyl-, 1626[8].
$C_{16}H_{13}NO_4S$ 2 - Naphthol- ? - sulfonic acid, 1-anilino, 191[3], 2308[3].
$C_{16}H_{13}NO_6$ Benzoin, 4'-nitro-, acetate, 327[1].
$C_{16}H_{13}N_3$ Pyrrole, 1(and 2)-phenylphenylazo-, 1078[6,7].
s Triazine, 2-methyl-4,6-diphenyl-, 207[9].
$C_{16}H_{13}N_3O$ Cinchophen, hydrazide, and -HCl, 3010[8].
$C_{16}H_{13}N_3O_2$ Coumarin. 3-phenyl-, semicarbazone, 3291[7].
1(2) - Phthalazone, 2-(p-acetamidophenyl)-, 1803[2].
Pyrazole, 3(or 5)-methyl-1-(p-nitrophenyl)-5(or 3)-phenyl-, 2856[8].
Pyrimidinedione, dihydroiminodiphenyl-, 3164[4].
4(3) - Quinazolone, 3-acetamido-2-phenyl-, 206[7].
- , 3-benzamido-2-methyl-, 206[8].
$C_{16}H_{13}N_3O_3$ 2-Phenazinol, acetamido-, acetate, 603[6,7,8].
$C_{16}H_{13}N_3O_5$ 1 - Phthalazineacetic acid, 2,4-dihydro - 4 - hydroxy - 2 - (p-nitrophenyl)-, and salts, 1803[1].
$C_{16}H_{13}N_3O_6$ Pyruvic acid, (o-carboxyphenyl)-, (p-nitrophenyl)hydrazide, 1803[3].
Quinonimine, N - (2-acetamido-4-nitrophenyl)-2-hydroxy-, acetate, 603[8].

$C_{16}H_{13}N_3O_7S$ 1 - Phthalazineacetic acid, 2,4-dihydro - 2 - (*p*-nitrophenyl)-4-sulfo-, *Na salt*, 1802^{9}.
$C_{16}H_{13}N_3O_8$ Dipiperonylamine, 6,6′-dinitro-, 2326^{1}.
$C_{16}H_{13}N_5O_7$ Imidazole, 1-methyl-2-phenyl-, picrate, 395^{7}.
Pyrazole, 3(or 5)-methyl-5(or 3)-phenyl-, 2855^{8}.
$C_{16}H_{13}N_5O_9$ 2-Indazolepropionic acid (?), picrate, 1622^{7}.
1 - Isoindazolepropionic acid (?), picrate, 1622^{7}.
$C_{16}H_{13}N_7O_8$ 4(or 5)-Imidazolecarboxanilide, 2′-amino-, picrate, 395^{1}.
$C_{16}H_{14}$ Anthracene, dimethyl-, 2853^{3}, 3003^{5}.
Naphthalene, 1,2-dihydro-4-phenyl-, 1401^{6}.
$C_{16}H_{14}As_2I_2N_2O_4$ Acetanilide, 5,5′ - arsenobis[2-hydroxy-3-iodo-, 1607^{4}, 3289^{2}.
$C_{16}H_{14}BrIN_2O_2S$ 2 - Amino-3-(*p*-bromophenyl sulfonyl) - 1 - methylquinolinium iodide, 1626^{8}.
$C_{16}H_{14}BrNO_3$ Phthalimidine, 2-(*β*-bromoethyl)-3-hydroxy-3-phenyl-, 1408^{2}.
$C_{16}H_{14}BrN_3S$ 2(3) - Thiazolone, 4-phenyl-3-*o*-tolyl-, hydrazone, Br deriv., 416^{4}.
$C_{16}H_{14}Br_2O$ Benzophenone, 3,5-dibromo-2′,4′,-6′-trimethyl-, 1736^{7}.
$C_{16}H_{14}Br_2O_6$ Diphenoquinone, 2,2′-dibromo-3,5,3′,5′-tetramethoxy-, 1225^{4}.
$C_{16}H_{14}ClNO_4$ Propionic acid, (chlorobenzoyl) hydroxyphenyl-, oxime, *and salts*, 3168^{3}.
$C_{16}H_{14}Cl_2O_6$ Diphenoquinone, 2,2′-dichloro-3,5,3′,5′-tetramethoxy-, 3695^{1}.
$C_{16}H_{14}FeO_6$ *o*-Vanillin, Fe deriv., 399^{5}.
$C_{16}H_{14}NO_2$ Methyl, di-*p*-anisylcyano-, 1402^{5}.
$C_{16}H_{14}N_2$ 1,4-Naphthylenediamine, 5-phenyl-, 1401^{6}.
Pyrazole, methyldiphenyl-, 2494^{7}.
—, 1-phenyl-5-*p*-tolyl-, 1590^{8}.
Quinoline, 4-(aminomethyl) - 2 - phenyl-, *and salts*, 204^{9}, 205^{1}.
$C_{16}H_{14}N_2O$ Benzamide, *N*-*o*-(cyanomethyl)-benzyl-, 392^{1}.
Indazole, 2 acetyl-3-*p*-tolyl-, 2496^{6}.
Pyrazole, 5-*p*-anisyl 1-phenyl-, 1590^{9}.
$C_{16}H_{14}N_2OS$ 1 - Thionaphthenealdehyde, 2-hydroxy - 4 - methyl-, phenylhydrazone, 203^{1}.
$C_{16}H_{14}N_2O_2$ *β*-Butenanilide, *α*-keto-*γ*-phenyl-, oxime, 360^{4}.
Hydrocinnamaldehyde, *α*,*β* - diketo *p*-methyl-, *α*-phenylhydrazone, 1590^{8}.
Indazole, 2-acetyl-3-*p*-anisyl-, 2496^{7}.
3-Indazolol, 2-*p*-tolyl-, acetate, 2496^{6}.
Phthalimidine, 2-(*p* - acetamidophenyl)-, 1803^{2}.
$C_{16}H_{14}N_2O_2S$ Dibenzothiophene, 2,7-di-acetamido-, 2155^{4}.
Quinoline, 2-amino-3-*p*-tolylsulfonyl, 1626^{7}.
$C_{16}H_{14}N_2O_3$ Hydrocinnamaldehyde, *α*,*β*-diketo-*p*-methoxy-, *α*-phenylhydrazone, 1590^{9}.
2 - Imidazolecarboxylic acid, 2,3,4,5-tetra-hydro-4-keto-2,5-diphenyl-, 2152^{9}.
3-Indazolol, 2-*p*-anisyl-, acetate, 2496^{7}.
$C_{16}H_{14}N_2O_3S$ Dibenzothiophenene, 2,7-di-acetamido-, *S*-dioxide, 2155^{4}.
Quinoline, 2-amino-8-methoxy-3-(phenylsul-fonyl)-, 402^{9}.
$C_{16}H_{14}N_2O_7$ 1-Naphthaleneacetic acid, *α*-acetyl-2,4-dinitro-, Et ester, 2325^{3}.
1-Propanol, 3-(2,4-dinitrophenoxy)-, benzo-ate, 740^{1}.
$C_{16}H_{14}N_4$ 1,2,3-Triazole, 5-methyl-1-phenyl-4-(phenyliminomethyl)-, 416^{8}.
$C_{16}H_{14}N_4NiO_6$ Glyoxylohydroxamic acid, phenyl-, oxime, Ni deriv., *salts*, 2822^{8,9}.
$C_{16}H_{14}N_4O$ 1,2,3 - Triazole-4-carboxanilide, 5-methyl-1-phenyl-, 416^{8}.
$C_{16}H_{14}N_4OS$ Δ^2 - 1,2,4 - Triazoline-3-mer-captan, 1-acetyl - 4 - phenyl-5-phenyl-imino-, 2162^{3}.
$C_{16}H_{14}N_4O_2$ 3(2) - *s* - Tetrazinone, 1(or 2)-acetyl - 1,4 - dihydro-4,6-diphenyl-, 1084^{7}.
$C_{16}H_{14}N_4O_4S_2$ Oxamide, *o*,*o*′-dithiobis[*N*-phenyl-, 600^{1}.
$C_{16}H_{14}N_4O_5$ Anthranilic acid, *N*-(*m*-nitroben-zoyl)-, *β* - acetylhydrazide, 206^{3}.
$C_{16}H_{14}N_6O$ 1,2,3 - Triazole - 4 - aldehyde, 1,5-diphenyl-, semicarbazone 416^{9}.
$C_{16}H_{14}N_6O_3$ Tricarballylic acid, trihydrazide, - *HCl*, 1926^{4}.
$C_{16}H_{14}N_6O_7$ 1,2,3-Triazole, 4,5-dimethyl-1-phenyl-, picrate, 416^{9}.
$C_{16}H_{14}N_6O_8$ Isoindazole, 7-acetamido-5-methyl-, picrate, 2497^{8}.
$C_{16}H_{14}O$ Anthrone, dimethyl-, 2677^{7}, 2853^{2,4}.
Dypnone, 3009^{9}.
$C_{16}H_{14}O_2$ 1,4-Butanedione, 1,4-diphenyl-, 1229^{2}.
Chalcone, *α*-methoxy-, 2156^{5}.
p-Tolil, *$SnCl_4$ addn. compd.*, 365^{2}.
$C_{16}H_{14}O_2S$ Thioflavanone, 6-methyl-, *S*-oxide, 199^{1}.
$C_{16}H_{14}O_3$ Flavanone, 4′-methoxy-, 2162^{3}.
$C_{16}H_{14}O_3S$ Thioflavanone, 6-methyl-, *S*-di-oxide, 198^{2}.
$C_{16}H_{14}O_4$ Anisil, *$SnCl_4$ addn. compd.*, 365^{2}.
Benzodi - 1,4 - pyrandione, tetramethyl-, 1624^{6,7}.
α,*α*′ - Bi-*o*-toluic acid, 1230^{8}.
p-Cresol, oxalate, 47^{2}.
2,6-*s*-Indacenediol, 1,5-diacetyl-, 912^{2}.
Mandelic acid, Me ester, benzoate, 378^{1}, 751^{1}.
Phenolsuccinein, 2676^{6}.
$C_{16}H_{14}O_4S_2$ *m*-Toluic acid, 5,5′-dithiobis-, 202^{9}.
$C_{16}H_{14}O_5$ 2-Acetonaphthone, 1,8-dihydroxy-, diacetate, 1053^{1}.
Benzoic acid, oxybis-, di-Me ester, 392^{2,3}.
Brazilin, 605^{4}, 2325^{9}.
Lactic acid, *β*-*p*-phenoxybenzoyl-(?), 593^{8}.
$C_{16}H_{14}O_6$ 2,3′-Bianisic acid (?), 400^{8}.
Hematoxylin, 605^{8}.
$C_{16}H_{14}S$ 1,2 Benzothiopyran, 6-methyl-4-phenyl-, 203^{9}, 204^{1}.
$C_{16}H_{15}AsClNO$ Phenarsazine, 6-acetyl-1-chloro-1,6-dihydro-3,9-dimethyl-, 1607^{1}.
$C_{16}H_{15}AsN_2O_8$ Arsanilic acid, *N*-(4-carbethoxy-oxy-3-nitrobenzoyl)-, 394^{3}.
$C_{16}H_{15}AsN_2O_{10}$ Arsanilic acid, *N*-(4-carbethoxy-oxy-3-nitrobenzoyl)hydroxy-, 2318^{6,7}.
$C_{16}H_{15}BO_6$ Acetonaphthone, hydroxy-, boro-acetate, 1052^{9}.
$C_{16}H_{15}BO_7$ 2-Acetonaphthone, 1,8-dihydroxy-, 1-boroacetate, 1052^{9}.
$C_{16}H_{15}BrO_4S_2$ 2-Propanone, 1-(*p*-bromophenyl-sulfonyl)-3-*p*-tolylsulfonyl-, 1626^{1}.
$C_{16}H_{15}BrO_5S_2$ 2-Propanone, 1-(*o*-anisylsulfonyl)-, 3-(*p*-bromophenylsulfonyl)-, 1625^{9}.
$C_{16}H_{15}ClCuN_2O_2$ Benzoin, *p*′-chloro-*p*-di-methylamino-, oxime, Cu deriv., 1055^{7}.
$C_{16}H_{15}ClN_2$ Δ^3-2-Butenone, 4-(*o*-chlorophenyl)-, phenylhydrazone, 762^{3}.
Δ^2-Pyrazoline, 5-(*o* - chlorophenyl)-3-methyl-1-phenyl-, 762^{3}.

$C_{16}H_{15}ClN_2O_3$ Benzamide, *N*-[*o*-(chloromethyl)-phenethyl]-*p*-nitro-, 391[9].
Propionamide, (chlorobenzoyl)hydroxy-phenyl-, oxime, 3168[5].
$C_{16}H_{15}ClO$ Isobutyryl chloride, *β,β'*-diphenyl-, 3451[9].
$C_{16}H_{15}ClO_2$ Propiophenone, *α*-chloro-*β*-methoxy-*β*-phenyl-(?), 2997[2].
$C_{16}H_{15}CuNO_2$ 2-Butanone, 3-hydroxy-1,4-diphenyl-, oxime, Cu deriv., 1055[6].
$C_{16}H_{15}CuNO_4$ Anisoin, oxime, Cu deriv., 1055[6].
$C_{16}H_{15}IN_2$ 4 - Amino - 1 - methyl-2-phenyl-quinolinium iodide, 3010[9].
$C_{16}H_{15}N$ Quinoline, 1,2-dihydro-1-methyl - 2 phenyl-, 1082[3].
$C_{16}H_{15}NO$ Acrylophenone, *β*-anilino-*p* methyl-, 1590[8].
$C_{16}H_{15}NO_2$ Acrylophenone, *β*-anilino-*p*-methoxy-, 1590[9].
Cinnamic alcohol, carbanilate, 2978[1].
Indole, 2-*p*-anisyl-5-methoxy-, 598[6].
Phthalimidine, 2-(*p*-phenetyl)-, 1803[2].
1,3 - Propanediol, 2-(5-acridyl)-, *and -HCl*, 1239[2].
$C_{16}H_{15}NO_3$ Acetanilide, *o*-(hydroxymethyl)-, benzoate, 1073[5].
—, *N*-hydroxy-*p*-phenyl-, acetate, 2848[2].
—, *p*-(*p*-hydroxyphenyl)-, acetate, 1073[5].
Benzanilide, *o'* (hydroxymethyl)-, acetate, 1073[5].
Benzophenone, 2,4,6-trimethyl-4'-nitro-, 1736[8].
4 - Pyridinepyruvic acid, *β*-phenyl , Et ester, 187[9].
$C_{16}H_{15}NO_4$ Benzene, 1-allyloxy-2-(*p* nitro-benzyloxy)-, 1798[1].
Cinchomeronic acid, 2-methyl-6 phenyl , mono-Et ester, 3206[8].
Phenethyl alcohol, *p* methyl , *p*-nitrobenzoate, 1794[6].
1-Propanol, 3-phenyl-, *p*-nitrobenzoate, 1610[9].
Serine, *N*-benzoyl-*β* phenyl , 3450[7].
$C_{16}H_{15}NO_6$ 1-Methylpyridinium salt of di-Me 2,6-dihydroxy - 4 - keto - 1,4 - pyran-3,5-dicarboxylate (?), 2860[8].
$C_{16}H_{15}N_3O$ 5-Acridinepropionic acid, hydrazide, *and di-HCl*, 2501[4].
$C_{16}H_{15}N_3O_2$ Δ[3]-2-Butenone, 4-phenyl , *p*-nitrophenylhydrazone, 762[1].
Δ[2] - Pyrazoline, 3-methyl-1-(*p*-nitrophenyl)-5-phenyl-, 762[2].
$C_{16}H_{15}N_3O_3$ Anthranilic acid, *N*-acetyl-, *β*-benzoylhydrazide, 206[8].
—, *N*-benzoyl-, *β*-acetylhydrazide, 206[7].
Δ[3]-2-Butenone, 4 - salicyl-, *p*-nitrophenylhydrazone, 762[4].
Δ[2]-Pyrazoline, 3-methyl - 1 - (*p*-nitrophenyl)-5-salicyl-, 762[4].
$C_{16}H_{15}N_3S$ 1,4,3 - Isothiodiazine, 5-phenyl-2-*o*(and *p*)-tolylamino-, *and -HBr*, 416[3,4].
2(3)-Thiazolone, 4-phenyl-3 *o*-tolyl-, hydrazone, *and - HBr*, 416[4].
$C_{16}H_{15}N_5O_7$ 3-Indoleethylamine, picrate, 759[7].
$C_{16}H_{15}N_5O_8$ 3-Indolecarbinol, *α*-(aminomethyl) , picrate, 758[9].
$C_{16}H_{15}N_5S$ 1,3,4-Triazole, 2-(benzalhydrazino) - 5 - (benzylmercapto)-, 2162[8].
$C_{16}H_{15}N_7$ 1,2,3 - Triazole-4-aldehyde, 1,5-diphenyl-, aminoguanidone, *-HNO₃*, 410[9].
$C_{16}H_{15}N_7O_7$ 1,2,3-Triazole, 4-(aminomethyl)-5-methyl-1-phenyl-, picrate, 410[8].
$C_{16}H_{16}$ Naphthalene, 1-(Δ[1]-cyclohexenyl)-, 1401[5].
$C_{16}H_{16}AsNO_3$ Phenazarsinic acid, 6-acetyl-3,9-dimethyl-, 1607[1].
$C_{16}H_{16}As_2N_2O_4$ Glycine, *p,p'* arsenobis[*N*-phenyl-, 2993[4].
$C_{16}H_{16}Br_6N_4S_2$ Benzothiazoline, 1-imino-2-methyl-, tribromide, 2858[1].
$C_{16}H_{16}ClNO$ Benzamide, *N*-[*p*-(chloromethyl)-phenethyl]-, 391[8].
$C_{16}H_{16}ClNO_2$ 2,8-Dimethoxy - 10 - methyl-acridium chloride, P 480[2].
$C_{16}H_{16}CuN_2O_2$ Benzoin, *p'*-dimethylamino-, oxime, Cu deriv., 1055[7].
$C_{16}H_{16}N_2$ Cinnamaldehyde, *α*-methyl-, phenylhydrazone, 759[7].
Δ[2]-Pyrazoline, methyldiphenyl-, 2494[8], 2495[1].
$C_{16}H_{16}N_2O$ Urea, *β*-9-fluoryl-*α,α* dimethyl-, 189[1].
$C_{16}H_{16}N_2O_2$ Benzil, bis(*N*-methyloxime), 752[6].
α,α'-Bi-*o*-toluamide, 1230[8].
Glyoxylic acid, phenyl-, Et ester, phenylhydrazone, 2152[9].
$C_{16}H_{16}N_2O_3$ Benzoic acid, *o*-methoxy-, *o*-methoxybenzalhydrazide, 2672[3].
Phanodorm, 3189[2].
$C_{16}H_{16}N_2O_3S$ Acetic acid, benzylsulfonyl-, benzalhydrazide, 1409[6].
$C_{16}H_{16}N_2O_4$ Tartranilide, 1789[8].
$C_{16}H_{16}N_2O_4S$ *p*-Toluenesulfonamide, *N*-(*o*-formylphenyl)-, oxime, Ac deriv., 762[8].
$C_{16}H_{16}N_2O_5$ *o* Benzotoluide, 5',6'-dimethoxy-3'-nitro-, 908[2].
$C_{16}H_{16}N_2O_6$ Hydrazine, *s*-divanilloyl-, 2672[3].
$C_{16}H_{16}N_4O_6$ Acetophenone, 2,4-dimethoxy-, 2,4-dinitrophenylhydrazone, 2849[1].
Benzaldehyde, 2 ethoxy-3-methoxy-6-nitro-, *p*-nitrophenylhydrazone, 179[2].
Compd., m. 232°, from 1-ethyl-2,3-di methoxybenzene and diazonium salt of 2,4-dinitroaniline, 2849[1].
Theobromine acetylsalicylate, 1030[2].
$C_{16}H_{16}N_4O_7$ *sym* - Homotetrahydroisoquinoline, picrate, 1413[8].
$C_{16}H_{16}N_4S$ 1,3,4-Thiodiazole, 2,5 di-*p*-toluino-, 2162[2].
1,3,4 - Triazole - 2 - mercaptan, 5-*p*-toluino-1-*p*-tolyl-, 2162[1].
$C_{16}H_{16}O$ Acetaldehyde, di-*p*-tolyl-, 2844[5].
Acetophenone, *p*-methyl-*α*-*p*-tolyl-, 2844[5].
9-Anthrol, 9,10 - dihydro - 1,3(and 1,4)-dimethyl-, 2853[5].
2 Butanone, diphenyl , 588[9], 2997[6].
$C_{16}H_{16}OS$ 4-Thiochromanol, 6-methyl-4-phenyl-, 203[8].
$C_{16}H_{16}O_2$ Acetic acid, di-*p*-tolyl , *Ca salt*, 2844[5].
Acetophenone, *p*-ethoxy-*α* phenyl-, 2158[8].
Anisole, vinylidenebis-, 2674[7].
9 - Anthrol, 1,2,3,4 - tetrahydro-, acetate, 1401[1].
Benzophenone, *p*-propoxy , 2158[6].
2 - Butanone, 3 - hydroxy - 1,4 - diphenyl-, 1055[7].
Hydrocinnamic acid, *α*-benzyl-, 3451[9].
Xanthydrol, 9-isopropyl-, *and perchlorate*, 2328[6].
$C_{16}H_{16}O_3$ Benzophenone, 3,4-dimethoxy-2'-methyl-, 385[8], 402[2].
p-Cresol, *α*-*p*-toloxy-, acetate, 401[1].
Propiophenone, 2,4-dihydroxy - 6 - methyl-*β*-phenyl-, 197[2].
$C_{16}H_{16}O_4$ Benzophenone, 4-hydroxy-3,2'-dimethoxy-6'-methyl-, 402[1].
2,7 - Naphthalenedicarboxylic acid, di-Et ester, 1619[1].

$C_{16}H_{16}O_4S$ Acetophenone, α-(o-phenetylsulfonyl)-, 420[1].
Hydrocinnamic acid, (p-tolylsulfonyl)-, 198[9].
$C_{16}H_{16}O_4S_2$ Thianthrene, 1,4,5,8 - tetramethyl-, S-tetraoxide, 2681[8].
$C_{16}H_{16}O_6$ 1,2 - Benzopyran - 3 - carboxylic acid, 6-hydroxy - 2 - keto - 5,7,8 - trimethyl-, Me ester acetate, 2320[7]
$C_{16}H_{16}S_2$ Thianthrene, 1,4,5,8-tetramethyl-, 2681[8].
$C_{16}H_{17}AsN_2O_6$ Arsanilic acid, N-(3-acetamido-anisoyl)-, 394[3].
$C_{16}H_{17}ClO_2$ Chromone, 3-butyryl-6-chloro-2-propyl-, 1238[1].
$C_{16}H_{17}ClO_5$ 4 - Chromanone, 8-acetyl-6-chloro-2-hydroxy - 2,3,3 - trimethyl-, acetate, 1238[2].
$C_{16}H_{17}Hg_4NO_9$ Acetanilide, ar-tetrakis(acetoxymercuri)-, 3162[1].
$C_{16}H_{17}N$ Aniline, N-α-propylbenzal , 592[4].
Indanamine, N-benzyl-, 2156[1].
—, N-methyl-N-phenyl-, 756[1].
—, N-tolyl-, 756[1].
$C_{16}H_{17}NO$ Benzamide, N-(p-methylphenethyl) , 1794[6].
2-Butanone, 1,4-diphenyl , oxime, 588[9].
Isobutyramide, β,β′-diphenyl , 419[7], 2997[4], 3451[9].
Isoindoline, 2-o-(hydroxymethyl)benzyl-, 418[1].
$C_{16}H_{17}NO_2$ Acetic acid, (p-dimethylamino phenyl)phenyl-, 187[9].
Acetophenone, p-ethoxy-α-phenyl , oxime, 2158[3].
Benzophenone, p-propoxy-, oxime, 21[illegible].
Cresol, 6-ethyl-, carbanilate, 2154[illegible]
Hemimellitenol, carbanilate, 1602[1].
$C_{16}H_{17}NO_2S$ 3-Pyrrolecarboxylic acid, 2,5-dimethyl - 1 - phenyl - 4 - thioformyl , Et ester, 1235[9].
$C_{16}H_{17}NO_3$ Benzilic acid, p-dimethylamino-, 187[9].
α-Toluamide, N-vanillyl-, 404[8].
$C_{16}H_{17}NO_3S$ p-Acetotoluide, α-benzylsulfonyl , 1409[4].
$C_{16}H_{17}NO_4S$ Acetophenone, α (o phenetylsulfonyl)-, oxime, 420[1].
Glycine, N-benzyl - N - p - tolylsulfonyl , 205[9].
$C_{16}H_{17}NO_5S$ Serine, β-phenyl-N-tolylsulfonyl , 593[7].
$C_{16}H_{17}NO_8$ Glucoside, 4-nitro-1 naphtho , 2487[2].
1,1,3 - Propanetricarboxylic acid, 2 keto-3 phenylcarbamyl-, tri-Me ester, 2861[6].
$C_{16}H_{17}N_3O$ Propionaldehyde, α,β-diphenyl-(?), semicarbazone, 1401[4].
Propiophenone, β-phenyl-, semicarbazone, 2997[4].
$C_{16}H_{17}N_3O_2$ 2-Propanone, 1-hydroxy-1,3-diphenyl-, semicarbazone, 906[4].
$C_{16}H_{17}N_3O_3$ 1-Phthalazineacetic acid, 2-(p-aminophenyl) - 1,2,3,4 - tetrahydro 4-hydroxy-, 1803[1].
$C_{16}H_{17}N_3O_3S_2$ Rhodanine, 5-(2,4-diacetamido-benzal)-3-ethyl-, 1627[9].
$C_{16}H_{17}N_3O_4$ Acetophenone, dimethoxy-, p-nitrophenylhydrazone, 1065[4], 2321[9].
2,3 - Pyrroledicarboxylic acid, 4-methyl , 3-ethyl ester, 4-benzoylhydrazide, 3455[4].
$C_{16}H_{17}N_5O_7$ Δ[1]-Pyrazoline, 1,3-dimethyl 5-phenyl-, picrate, 761[9].
$C_{16}H_{18}$ Ethane, as-di-p-tolyl-, 187[9].
$C_{16}H_{18}AsNO$ Phenarsazine, 1-butoxy-1,6-dihydro-, 1606[9].
$C_{16}H_{18}ClHgN_3NaO_7$ See *Novasurol*.
$C_{16}H_{18}ClN_3S$ See *Methylene blue*.
$C_{16}H_{18}Cl_2O_2Te$ Di - p - phenetyltellurium dichloride, 907[2].
$C_{16}H_{18}Cl_2O_4Te$ Bis(2,4 - dimethoxyphenyl)-tellurium dichloride, 907[4].
$C_{16}H_{18}MoN_6O_8$, 3656[9].
$C_{16}H_{18}N_2$ Acetamidine, N,N′-di-p-tolyl-, 1799[4].
—, N-methyl-N-phenyl - N′ - (m-tolyl)-, 1799[4].
Isoindoline, 2 - [o-(aminomethyl)benzyl]-, 418[1].
o-Toluidine, N[α - (m - toluino)ethylidene]-, 1799[4].
$C_{16}H_{18}N_2O$ p-Phenetidine, N-(α-anilinoethylidene)-, 1799[4].
α - Toluamidine, N′-p-phenetyl , 1218[4].
$C_{16}H_{18}N_2O_2$ Acetophenone, 3,4 dimethoxy-, phenylhydrazone, 2321[8].
—, p-methoxy-, p-anisylhydrazone, 598[8].
$C_{16}H_{18}N_2O_3$ Phenetole, p,p′-azoxybis-, 174[9].
$C_{16}H_{18}N_2O_3S$ Glycine, N-naphthylcarbamyl-α-propylmercapto-, 924[4].
2 - Propanone, 1 - (p-anisylsulfonyl)-, phenylhydrazone, 419[2]
$C_{16}H_{18}N_2O_4$ Barbituric acid, 5 butyl-5-phenacyl-, 3691[9].
—, 5 isobutyl-5-phenacyl-, 3691[9].
3 - Indolecarbinol, α - (acetamidomethyl)-1-acetyl-, acetate, 758[9].
2,4 - Pyrroledicarboxylic acid, 5-(anilino methyl)-3-methyl , mono-Et ester, 2160[4].
$C_{16}H_{18}N_2O_5$ Hydantoinacetic acid, 5-anisal α,1-dimethyl , Me ester, 367[2].
—, 5-anisalmethyl , Et ester, 366[9], 367[1].
$C_{16}H_{18}N_2O_6$ Proline, 1-(N-formyltyrosyl) , formate, 3169[9].
$C_{16}H_{18}N_2O_8$ 1,1,3,3 - Propanetetracarboxylic acid, monophenylhydrazide, tri-Me ester, 2861[6].
$C_{16}H_{18}N_2S$ Urea, α-(m-methylphenethyl)-β-phenylthio-, 1794[5].
$C_{16}H_{18}N_4O_2S$ 2,3 - Pyrroledicarboxylic acid, 4-methyl 2-ethyl ester, 3-phenylthiosemicarbazide, 3455[9].
$C_{16}H_{18}N_4O_7$ Phenethylamine, dimethyl-, picrate, 1794[6].
$C_{16}H_{18}N_4O_8$ Benzylamine, (ethoxymethyl) , picrate, 391[4,5].
2-Propanol, 1-anilino - 2 - methyl-, picrate, 2834[4].
$C_{16}H_{18}N_4O_9$ 3-Pyrrolepropionic acid, 2-ethyl-4 methyl , picrate, 1236[9].
$C_{16}H_{18}N_4S_2$ Biurea, dithio-β,β′-di-p-tolyl-, 2162[4].
$C_{16}H_{18}N_{12}O_{14}$ Guanidine, α,α′-ethylenebis , dipicrate, 3690[4].
$C_{16}H_{18}O$ Ether, bis(α-methylbenzyl), 1985[7].
Phenethyl ether, 1985[9].
$C_{16}H_{18}O_2$ Anisole, o,p′ - methylenebis[4-methyl-, 401[2].
m,m′ Bianisole, 4,4′-dimethyl-, 400[9].
Hydrobenzoin, α,α′-dimethyl-, 3000[1].
$C_{16}H_{18}O_2Te_2$ Ditelluride, bis(3-methyl-p-anisyl), 2670[3].
—, bis(p-phenetyl), 907[3].
$C_{16}H_{18}O_3$ Cyclohexanone, 2-(hydroxymethylene) - 3,5 - dimethyl-, benzoate, 380[4].
$C_{16}H_{18}O_4$ Acenaphthenediol, tetrahydro-, diacetate, 1405[4].
Anisole, m,m′-ethylenedioxybis- (?), 2226[1].

3 - Furancarboxylic acid, 2,3-dihydro-3 isopropyl - 2 - keto-5-phenyl-, Et ester, 404[7].
2,7 - Octanedione, 4,5-di-2-furyl-(?), 413[1]
$C_{16}H_{18}O_4Te$ Ditelluride, bis(2,4-dimethoxyphenyl), 907[5].
$C_{16}H_{18}O_5$ 1,2 - Benzopyran - 3 - carboxylic acid, 6,8a - dihydro - 2,6 - diketo-5,7,8-trimethyl-, isopropyl and Pr esters, 2320[7]
—, 2-keto-6 methoxy-6,7,8 trimethyl-, Et ester, 2320[7].
$C_{16}H_{18}O_6$ Addn. compd., m. 123°, of di-Me oxalate and PhOH, 47[2]
$C_{16}H_{18}O_7$ 1,2 - Benzopyran - 3 - carboxylic acid, 6,8a - dihydro - 2,6 - diketo 5,7,8-trimethyl-, β,γ-dihydroxypropyl ester, 2320[7]
$C_{16}H_{19}As$ Arsine, mesitylmethylphenyl-, 393[4].
$C_{16}H_{19}BrO_2$ Anthrol, bromooctahydro, acetate, 1405[3].
$C_{16}H_{19}BrO_6$ 1,2-Propanediol, 1-(2 bromo 5,6 dimethoxy - 3,4 methylenedioxyphenyl), diacetate, 3450[3]
$C_{16}H_{19}N$ Benzohydrylamine, N, N, α trimethyl-, 3451[8].
$C_{16}H_{19}NO$ Benzohydrylamine, p-propoxy-, 1400[8], *and -HCl*, 2158[6]
Cyclopentanenitrile, 3 benzoyl 1,2,2-trimethyl, 2158[3]
Phenethylamine, α (p-phenetyl), 1400[7] *-HCl*, 2158[8]
2 - Propanol, 2 (aminomethyl) 1,1 diphenyl, 58[8]
$C_{16}H_{19}NO_2$ Camphorimide, N phenyl, 1800[7].
1 - Naphthalenecarbamic acid, Am ester, 1232[9].
3 Pentanol, 1 - naphthalenecarbamate, 1233[1].
$C_{16}H_{19}NO_4$ (See also *Ecgonine, benzoate*)
Cresol, α,α' iminobis, *and HCl*, 405[1]
$C_{16}H_{19}NO_5$ 3 Indoleacetic acid, 2 carboxy 7 methoxy, di Et ester, 1604[7]
$C_{16}H_{19}N_3O$ Hydrazine, α,β bis(α methyl benzyl) α nitroso, 1604[4].
$C_{16}H_{19}N_3O_2S$ Ketone, butyl 2 thienyl methyl, p nitrophenylhydrazone, 3005[5, 8]
$C_{16}H_{19}N_3O_2S$ Hydantoin, 1 (N benzoylleucyl)-2-thio, 3298[9]
$C_{16}H_{19}N_3O_3S$ Benzenesulfonic acid, (5 ethyl-3 methyl - 4 - propionyl 2 pyrrylazo), 1236[4].
$C_{16}H_{19}N_3O_5S$ 3 Pyrrolecarboxylic acid, 1,2,5, trimethyl 4 sulfophenylazo, Et ester, 1235[9]
$C_{16}H_{19}N_3O_{11}$ Uracil triacetylxyloside, methyl-nitro-, 1812[9]
$C_{16}H_{19}N_5O_7$ Indazole, 2 ethyl 4,5,6,7 tetrahydro - 5 methyl, picrate, 389[8]
, 4,5,6,7 - tetrahydro 2,4,6 trimethyl, picrate, 389[8].
Isoindazole, 1 ethyl - 4,5,6,7 - tetrahydro 5-methyl-, picrate, 389[8]
—, 4,5,6,7 - tetrahydro 1,4,6 - trimethyl, picrate, 389[8]
Pyridine, 2 isoamylamino-, picrate, 3009[1].
$C_{16}H_{20}AsI$ Dimethylphenethylphenylarsonium iodide, 2830[6].
$C_{16}H_{20}AsI_3$ Dibenzyldimethylarsonium tri iodide, 2815[9].
$C_{16}H_{20}As_2N_4Na_2O_8$ + H_2O See *Tryparsamide*.
$C_{16}H_{20}NO_3$ + $3H_2O$ See *Kukoline*.
$C_{16}H_{20}NO_4$ See *Dicentrine*.
$C_{16}H_{20}N_2$ Aniline, p,p'-sec-butylidenebis, P 3097[4].
m,m' - Bianiline, N, N, N', N'-tetramethyl-, 2837[1].
Hydrazine, α,β - bis(α-methylbenzyl)-, *-HCl*, 1604[4].
Indazole, 2-benzyl - 4,5,6,7 - tetrahydro-4,6-dimethyl, 389[8].
Isoindazole, 1 - benzyl - 4,5,6,7 - tetrahydro-4,6 dimethyl-, 389[8].
$C_{16}H_{20}N_2O$ Urea, α-isoamyl β-1-naphthyl-, 2319[5].
$C_{16}H_{20}N_2O_4$ Benzylamine, oxalate, 900[1].
$C_{16}H_{20}N_2O_4S$ 2 - Propanesulfonic acid, 1-phenylcarbamyl-, $PhNH_2$ salt, 1979[6].
$C_{16}H_{20}N_2O_5$ 3 - Hydantoinacetic acid, 5-p-methoxybenzyl - α - methyl-, Et ester, 366[7].
$C_{16}H_{20}N_2O_5S$ Butyric acid, β-sulfo-, benzidine salt, 1979[4].
$C_{16}H_{20}N_2O_6$ Nipecotic acid, 4-hydroxy-1 methyl-, Et ester, p-nitrobenzoate, *-HCl*, 3010[6].
$C_{16}H_{20}N_2O_9$ Uracilxylose, 1-methyl-, triacetate, 1812[7]
$C_{16}H_{20}N_4O_7$ Pyrrole, 2-ethyl-4-methyl-3-propyl, picrate, 1236[5].
$C_{16}H_{20}O$ Butyrophenone, cyclohexenyl-, 3447[5].
Isobutyraldehyde, β,β' diphenyl-, 3000[2]
$C_{16}H_{20}O_2$ 9-Anthrol, 1,2,3,4,5,6,7,8-octahydro, acetate, 1404[2]
9 Phenanthrol, 1,2,3,4,5,6,7,8 - octahydro-, acetate, 1404[1]
$C_{16}H_{20}O_3$ Coumarin, 6-hexyl-7 hydroxy-4-methyl, 2995[9]
$C_{16}H_{20}O_4$ Cyclohexaneacetic acid, α hydroxy-, Me ester, benzoate, 378[5]
Cyclohexanecarbinol, α-methyl, acid phthalate, 3287[1]
$C_{16}H_{20}O_5$ Caprophenone, 2,4-dihydroxy-, diacetate, 2995[8]
Taxic acid, 767[5].
$C_{16}H_{20}O_8$ 1,2 Propanediol, 1-(2,3-dimethoxy-4,5 methylenedioxyphenyl), diacetate, 3450[1]
$C_{16}H_{21}NO_2$ Cyclopentanecarboxamide, 3-benzoyl-1,2,2 trimethyl, 2158[3].
$C_{16}H_{21}NO_3$ (See also *Homatropine*.)
Camphoranilic acid, 1800[7]
Ketone, 4 - hydroxy-1,4-dimethyl 3-piperidyl methyl, benzoate, *HCl*, 1809[4, 5].
$C_{16}H_{21}NO_3S$ Trimethylphenylammonium p-toluenesulfonate, 1795[4].
$C_{16}H_{21}NO_4$ Nipecotic acid, 4 hydroxy-1,4-dimethyl, Me ester, benzoate, *and derivs*, 1810[4, 5]
$C_{16}H_{21}NO_6$ Glutamic acid, N-benzoyl-, di-Et ester, 1991[4]
$C_{16}H_{21}N_3O$ Butyrophenone, cyclopentenyl-, semicarbazone, 3447[7].
Propiophenone, cyclohexenyl-, semicarbazone, 3447[5].
$C_{16}H_{22}$ Naphthalene, decahydrophenyl-, 1402[2].
$C_{16}H_{22}Br_6N_2$ 2,4 Lutidine, -HBr, $C_2H_2Br_4$ ....
$C_{16}H_{22}N_2O_4$ Nipecotic acid, 4-hydroxy-1-methyl-, Et ester, p-aminobenzoate, *di-HCl*, 3010[8]
$C_{16}H_{22}N_2O_6$ Glycine, N-(β-carbomethoxy-aminobutyryl)-N-phenyl-, Et ester, 44[4].
$C_{16}H_{22}N_4O_5S$ 1,2,3-Triazole - 4 - carboxylic acid, 5 hydroxy-1-p-tolylsulfonyl-, Me ester, piperidine deriv., 1408[8].
$C_{16}H_{22}O_4$ Resorcinol, 4-hexyl-, diacetate, 2995[9].
$C_{16}H_{22}O_5S$ Cyclohexaneacetic acid, α-hydroxy, Me ester, p-toluenesulfonate, 378[5].

$C_{16}H_{22}O_8S$ Glucose, 3(and 6)-*p*-toluenesulfonylmonoacetone-, and isomer, 2984[9], 2985[6].
$C_{16}H_{22}O_{11}$ *d*-Glucose, pentaacetate, 2987[4].
$C_{16}H_{23}NO$ Cyclooctanemethylamine, *N*-benzoyl-, 2151[1].
$C_{16}H_{23}NO_2$ 1-Butanol, 3-(1-piperidyl)-, benzoate, -*HCl*, 1788[7].
$C_{16}H_{23}NO_3$ Di-Ac deriv., m. 104–6°, of base from condensation product of PhNHOH and acetone, 2837[8].
$C_{16}H_{23}NO_4S$ 4 - Piperidinecarboxylic acid, 4-hydroxy - 2,2,6,6-tetramethyl-, Me ester, 2-thiophenecarboxylate, *and salts*, 2854[7].
$C_{16}H_{23}NO_5$ Carbanilic acid, *o*-carboisobutoxyoxy-, Bu ester, 2320[1].
—, *o*-carbobutoxyoxy-, isobutyl ester, 2320[1].
$C_{16}H_{23}NO_6$ Pyroxonine, 765[4].
$C_{16}H_{24}AsNO_5$ Benzenearsonic acid, 3-valeryl-4-valerylamino-, 1605[9].
$C_{16}H_{24}BrNO$ 1 - [*β*-Keto-*β*-(1,2,2,3-tetramethylcyclopentyl)ethyl]pyridinium bromide, 1399[4].
$C_{16}H_{24}Br_4Fe_4O_{16}$ + $3H_2O$, 2127[8].
$C_{16}H_{24}ClNO_2$ Apothesine, 240[7].
$C_{16}H_{24}N_2O$ Benzamide, *N*-*δ*-1-piperidylbutyl, 417[7].
Cyclopentanemethylamine, 1,2,2,3 - tetramethyl - *N* - nitroso-*N*-phenyl, 1399[1].
$C_{16}H_{24}N_2O_4S$ Leucine, *N*-(*N*-tolylsulfonylalanyl)-, 3298[6]
$C_{16}H_{24}N_2S_2$ Valeramide, *N*, *N'*-*p*-phenylenebis[thio-, 364[1].
$C_{16}H_{24}N_4O_8$ 3-Hexanone, 1-diethylamino-, picrate, 1217[3].
$C_{16}H_{24}N_4O_9$ Leucine, Bu and isobutyl esters, picrates, 1055[3].
$C_{16}H_{24}O$ Δ^2-2-Decenol, 2-phenyl-, 1602[3].
$C_{16}H_{24}O_2$ 7 - *p* - Cymenecarboxylic acid, isoamyl ester, 2488[6].
$C_{16}H_{24}O_3$ Anisic acid, *α*-methylheptyl ester, 3451[2].
Benzoic acid, methoxy-, *α*-methylheptyl ester, 3451[1,2].
Capriphenone, 2,4-dihydroxy-, 2320[2].
$C_{16}H_{24}O_8$ 1,2,2,3 - Cyclobutanetetracarboxylic acid, tetra-Et ester, 48[9].
$C_{16}H_{24}O_{10}$ Mannoside, tetraacetylethyl-, 1790[4].
$C_{16}H_{25}AsN_2O_7$ Carbamic acid, *N*, *N'*-(*p*-arsono-*o*-phenylene)bis-, di-Bu ester, 1605[9].
$C_{16}H_{25}N$ Cyclopentanemethylamine, 1,2,2,3-tetramethyl-*N*-phenyl-, -*HCl*, 1399[1].
Piperidine, 1 - (*α*-ethyl-*α*-methylphenethyl)-, *and chloroplatinate*, 1053[3].
$C_{16}H_{25}NO_2$ Pelargonamide, *N*-*p*-hydroxybenzyl-, 404[9].
Triethylamine, *β*-(6-allyl-*o*-anisyloxy), P 2392[7].
$C_{16}H_{25}NO_3$ Alanine, *N*-(camphorylidenemethyl)-, Et ester, 1593[2].
Butyraldehyde, *β* - (*N* - methylbenzamido)-, di-Et acetal, 1788[5].
Pelargonamide, *N* - 3,4 - dihydroxybenzyl-, 404[9].
p-Toluic acid, *α*-ethoxy-, *β*-diethylaminoethyl ester, *and* -*HCl*, 378[9].
$C_{16}H_{25}NO_4$ Dinicotinic acid, 4-ethyl-1,4-dihydro - 1,2,6 - trimethyl-, di-Et ester, 3296[5].
$C_{16}H_{26}IN$ (2 - Benzylcyclohexyl)trimethylammonium iodide, 2665[7,8].
$C_{16}H_{26}N_2O_2$ Benzoic acid, *p*-amino-, *γ*-diisopropylaminopropyl ester, -*HCl*, 1852[8].
$C_{16}H_{26}N_2O_6$ Gluconic acid, tetramethyl-, phenylhydrazide, 1060[3,4].
$C_{16}H_{26}N_4O_7$ Butylamine, *N*, *N*-diethyl-*α*,*α*-dimethyl-, picrate, 3280[4].
$C_{16}H_{26}N_6O_7$ *α*,*α*,*β* - Triethyl - *β*,*γ*,*γ* - trimethylguanidinium picrate, 374[9].
$C_{16}H_{26}O_2$ Caryophyllene, formate, 187[2].
Resorcinol, 4-decyl-, 2320[3].
$C_{16}H_{26}O_3$ Camphor, 3-(hydroxymethyl)-, valerate, 1228[1].
$C_{16}H_{27}ClN_2O_2$ See *Alypine.*
$C_{16}H_{27}N$ Aniline, *N*-amyl-*N*-isoamyl-, 2991[2].
$C_{16}H_{27}NO$ Propylamine, *γ*-isoamoxy-*N*, *N*-dimethyl-*γ*-phenyl-, *and* -*HCl*, 1604[9].
Triethylamine, *β*-(*α* - propoxybenzyl)-, -*HCl*, 1604[9].
Tripropylamine, *γ*-methoxy-*γ*-phenyl-, 1604[9].
$C_{16}H_{27}N_3O$ Semicarbazone, m. 234°, of ketone from caryophyllene, 1073[3].
Semicarbazone of ketone from cedrene, 1073[3].
$C_{16}H_{28}Cl_6N_2PtS_2$ Trimethyl - 2 - thienylmethylammonium chloroplatinate, 390[6].
$C_{16}H_{28}O_2$ Hydnocarpic acid, 172[2].
$C_{16}H_{28}O_3$ 1-Propanone, 3-hydroxy-1-(1,2,2,3-tetramethylcyclopentyl)-, butyrate, 1399[7].
$C_{16}H_{28}O_4$ Malonic acid, cyclohexylpropyl-, diethyl ester, 3160[2].
$C_{16}H_{28}O_5$ Thapsic acid, 7-keto-, 1791[8].
$C_{16}H_{28}O_6$ Pimelic acid, *β*-carboxymethyl-*β*-methyl-, tri-Et ester, 172[6].
$C_{16}H_{29}Br$ Hendecane, bromocyclopentenyl-, 3160[5].
$C_{16}H_{29}IN_2$ 2 - Diisoamylamino - 1 - methylpyridinium iodide, 3009[2].
$C_{16}H_{29}NO$ *ι*-Undecylenic acid, piperidide, 2845[1].
$C_{16}H_{30}Cl_2N_{12}Pt_2$ + nH_2O, 2626[3]
$C_{16}H_{30}O$ Cyclohexadecanone, 1792[5], 2151[6]
Hydnocarpyl alcohol, 3160[5].
$C_{16}H_{30}O_2$ Cyclohexanecapric acid, 3160[5].
2,4-Hexadecanedione, 738[9].
Hydnocarpic acid, dihydro-, 1598[8].
Δ^2-Hypogeic acid, 2819[9].
Palmitoleic acid, 3280[9].
$C_{16}H_{30}O_3$ Cyclohexanecapric acid, hydroxy-, 3160[5].
Cyclohexanepelargonic acid, hydroxy-, methyl ester, 3160[5].
Hydnocarpic acid, dihydro-*ι*-hydroxy-, 1599[1].
Myristic acid, *β*-keto-, Et ester, 2660[7].
$C_{16}H_{30}O_4$ 1,10-Decanedicarboxylic acid, di-Et ester, 1789[2].
Dibasic acid, m. 53–8°, from muscone, *and Ag salt*, 2834[3].
1,12-Dodecanedicarboxylic acid, di-Me ester, 1789[3].
1,12-Dodecanediol, diacetate, 1789[4].
Thapsic acid, 1789[3].
$C_{16}H_{31}NO$ Hydnocarpamide, dihydro-, 1599[1].
Undecylic acid, piperidide, 2845[1].
$C_{16}H_{31}N_3O$ Cyclopentadecanone, semicarbazone, 1792[6].
$C_{16}H_{32}$ Hexadecene, 3685[1].
$C_{16}H_{32}Br_2$ Hexadecane, 1,16-dibromo-, 1789[2].
$C_{16}H_{32}N_2S$ Piperidine, *γ*,*γ'*-thiobis[1-propyl-, 362[9].
$C_{16}H_{32}O$ Muscol, 2834[3].
$C_{16}H_{32}O_2$ See *Palmitic acid.*
$C_{16}H_{32}O_3$ Jalapinolic acid, 366[1].
$C_{16}H_{34}$ Hexadecane, 3685[1].
$C_{16}H_{34}O$ (See also *Cetyl alcohol.*)
Ether, bis(*α*-methylheptyl), 361[9].
$C_{16}H_{34}O_2$ 5,6-Dodecanediol, 5-butyl-, 1786[8].
1,16-Hexadecanediol, 1789[1].

Tetradecane, 1,14-dimethoxy-, 1789[4].
$C_{16}H_{36}IN$ Tetrabutylammonium iodide, 3688[6].
$C_{16}H_{36}NOS$ Ethylamine, β,β′-sulfinylbis[N, N-dipropyl-, *di-HCl*, 40[3].
$C_{16}H_{36}N_2O_2S$ Ethylamine, β,β′-sulfonylbis[N, N-dipropyl-, *and di-HCl*, 40[3].
$C_{16}H_{36}N_2S$ Ethylamine, β,β′-thiobis[N, N-dipropyl-, *and di-HCl*, 40[2].
$C_{16}H_{36}Pb$ Plumbane, butyltriisobutyl-, 1589[9].
—, tetrabutyl-, 1589[8].
$C_{16}H_{37}NO$ Tetrabutylammonium hydroxide, 3747[4].
$C_{17}H_9Cl_3O_5$ 1-Xanthenecarboxylic acid, 2,3,4-trichloro-9,9-dihydroxy-5-methyl-, lactone, acetate, 1231[8].
$C_{17}H_{10}Br_3NO_2$ 1-Naphthalenecarbamic acid, 2,4,6-tribromophenyl ester, 2319[4].
$C_{17}H_{10}N_6S$ Triazolindole, 2,2′-thiocarbonylbis-, 1810[9].
$C_{17}H_{10}O$ Benzanthrone, P 316[7], 1402[7], P 3171[5].
$C_{17}H_{10}O_3$ 7-*meso* Benzanthrenone, 5,6(or 8,9)-dihydroxy-, 411[6].
1,2′-Spirobiindan-3,1′,3′ trione, 185[8].
$C_{17}H_{11}BrO_2$ 1,2-Pyrone, 3-bromo-4,6-diphenyl-, 1069[8].
$C_{17}H_{11}Br_3Se$ Compd., m. 139.8°, from tribromo-2,4-diphenylselenophene and MeI, 592[5].
$C_{17}H_{11}ClN_2O_6S$ Cinnamonitrile, α-(p-chlorophenylsulfonyl)-5-hydroxy-2-nitro-, acetate, 402[8].
$C_{17}H_{11}ClN_4O_7$ 4-Chloro-1-phenylpyridinium picrate, 586[6].
$C_{17}H_{11}ClOS$ 1,4-Thiopyrone, 3-chloro-2,6-diphenyl-, *and -HCl*, 199[9], 200[7].
$C_{17}H_{11}ClO_3S$ 1,4-Thiopyrone, 3-chloro-2,6-diphenyl-, S-dioxide, 200[2].
$C_{17}H_{11}ClS_2$ 1,4-Thiopyrone, 3-chloro-2,6-diphenyl-4-thio-, 200[5].
$C_{17}H_{11}HgNSe$ Selenophene, 2-(cyanomercuri)-3,5-diphenyl-, 592[5].
$C_{17}H_{11}KO_2$ Ketone, 3-hydroxy-2-naphthyl phenyl, K deriv., 910[9].
$C_{17}H_{11}NO_2$ 3,7-*peri*-Naphthoquinoline-2(3),7-dione, 4-methyl-, 398[2].
$C_{17}H_{11}NO_3$ 3,7-*peri*-Naphthoquinoline-2(3),7-dione, 4-methoxy-, 398[2].
Picolinic acid, [1(and 2)-naphthoyl]-, *and -HCl*, 764[7].
$C_{17}H_{11}N_3OS$ Benzothiazole, 1-(hydroxynaphthylazo)-, 2858[2].
$C_{17}H_{11}N_5O_9$ 1-(p-Nitrophenyl)pyridinium picrate, 586[2].
$C_{17}H_{11}N_5O_{10}$ 4(1)-Pyridone, 1-[m(and p)-nitrophenyl]-, picrate, 586[4,5].
$C_{17}H_{12}BrNO_2$ 1-Naphthalenecarbamic acid, bromophenyl ester, 2319[4].
$C_{17}H_{12}Br_2OS$ 1,4-Thiopyrone, 2,6-diphenyl-, dibromide, 199[9].
$C_{17}H_{12}Br_2O_2$ 1,4-Pyrone, 2,6-diphenyl-, dibromide, 200[4].
$C_{17}H_{12}ClNO_2$ 1-Naphthalenecarbamic acid, chlorophenyl ester, 2319[4].
$C_{17}H_{12}ClNO_2S$ 1,4-Thiopyrone, 3-chloro-2,6-diphenyl-, S-dioxide, oxime, 200[3].
$C_{17}H_{12}N_2O_2$ $\Delta^{2,3'}$-Bi[indole]-2′,3-dione, methyl-, 3456[2].
Isoindigotin, methyl-, 3456[9].
4-Pyrazolecarboxylic acid, 5-methyl-1-phenyl-3-salicyl-, lactone, 599[7].
$C_{17}H_{12}N_2O_3$ 1-Naphthoic acid, 3-hydroxy-4-phenylazo-, *and Na salt*, 1233[9].
$C_{17}H_{12}N_2O_4$ 1-Naphthalenecarbamic acid, nitrophenyl ester, 2319[4].
$C_{17}H_{12}N_2O_4S$ 2-Thiophenecarboxylic acid, 4-(2-hydroxy-1-naphthylazo)-, acetate, 2854[9].
$C_{17}H_{12}N_2O_5S$ Isoindigotinsulfonic acid, methyl-, *and salts*, 3456[1].
$C_{17}H_{12}N_2S_2$ Quinrhodine, 3-benzyl-, 1627[5].
Thiazoloquinoline, 2-(benzylmercapto)-, 1627[1].
$C_{17}H_{12}N_4O_8$ 4(1)-Pyridone, 1-phenyl-, picrate, 586[4].
$C_{17}H_{12}N_6O_2S$ Isatin, 3,3′-thiocarbohydrazone, 1810[8].
$C_{17}H_{12}OS$ 1,2-Pyrone, 4,6-diphenyl-2-thio-, 1069[7].
1,4-Thiopyrone, 2,6-diphenyl-, *and -HCl*, 199[5], 200[1].
$C_{17}H_{12}O_2$ Benzoic acid, 2-naphthyl ester, 2720[3].
Ketone, 3-hydroxy-2-naphthyl phenyl, 910[9].
1,2-Pyrone, 4,6-diphenyl-, 1069[1,7].
$C_{17}H_{12}O_3$ 1,2,4-Cyclopentanetrione, 3,5-diphenyl-, 207[8].
2,7-Naphthalenediol, benzoate, 911[1].
$C_{17}H_{12}O_3S$ Thiochromone, 3-hydroxy-6-methyl-, benzoate, 199[4].
1,4-Thiopyrone, 2,6-diphenyl-, S-dioxide, 199[5].
$C_{17}H_{12}O_4$ Chromone, 3,7-dihydroxy-2-styryl-, 196[2].
$C_{17}H_{12}O_5$ Chromone, 3,5,7-trihydroxy-2-styryl-, 196[3].
Furoin, benzoate, 1615[6].
$C_{17}H_{12}S_2$ 1,4-Thiopyrone, 2,6-diphenyl-4-thio-, 200[5].
$C_{17}H_{13}BO_7$ Xanthone, 1-hydroxy-, boroacetate, 1052[9].
$C_{17}H_{13}BrN_2$ 2-Naphthaldehyde, 5-bromo-, phenylhydrazone, 1216[5].
$C_{17}H_{13}BrOS$ Thiochromone, 3-(α-bromobenzyl)-6-methyl-, 203[6].
$C_{17}H_{13}BrO_2$ 9-Anthracenecarbinol, 10-bromo-, acetate, 3003[7].
$C_{17}H_{13}Br_3$ Anthracene, 2,3,9-tribromo-10-isopropyl-, 3003[8].
$C_{17}H_{13}Br_4NO_3$ Valerophenone, α,β,γ,δ-tetrabromo-m-nitro-δ-phenyl-, 749[7].
$C_{17}H_{13}ClO$ 3-Pentadienone, 1(or 2)-chloro-1,5-diphenyl-, 2996[9].
$C_{17}H_{13}N$ Paraberine, 1083[7].
$C_{17}H_{13}NO$ 1,2-β-Indenoindole, 5-acetyl-5,10-dihydro-, 1620[1].
2(1)-Naphthalenone, 1-p-tolylimino-, 191[3].
$C_{17}H_{13}NOS$ 1,4-Thiopyrone, 2,6-diphenyl-, oxime, 200[7].
$C_{17}H_{13}NOS_2$ 4(5)-Thiazolone, 5-benzal-2-(benzylmercapto)-, 600[6].
$C_{17}H_{13}NO_2$ Benzamide, N-(8-hydroxy-1-naphthyl)-, 1073[6].
Cinchophen, 6-methyl-, *and salts*, P 424[6].
1-Naphthalenecarbamic acid, Ph ester, 2319[4].
2(1)-Naphthalenone, 1-(o-anisylimino)-, 191[1].
1-Naphthanilide, 3-hydroxy-, 1233[4].
Quinolinecarboxylic acid, 4-methyl-2-phenyl-, 418[9].
$C_{17}H_{13}NO_3$ Cincophen, 3-methoxy-, 205[1].
2-Indanglyoxylanilide, 1-keto-, 1077[7].
$\Delta^{2,4}$-1-Pentadienone, 1-(m-nitrophenyl)-5-phenyl-, 749[7,9], 750[1].
$C_{17}H_{13}NO_3S$ 1,4-Thiopyrone, 2,6-diphenyl-, S-dioxide, oxime, 200[3].
$C_{17}H_{13}NO_5$ Δ^2-5,5-Isoxazolinedicarboxylic acid, 3,4-diphenyl-, 2327[4].
$C_{17}H_{13}NO_6$ Δ^2-5,5-Isoxazolinedicarboxylic acid, 2327[2].

$C_{17}H_{13}N_3O_2$ 4(1)-Pyridone, 1-[p-(p-hydroxyphenyl)phenylazo]-, 585[2], 586[5].
$C_{17}H_{13}N_3O_4$ Naphthylamine, dinitrotolyl-, 3448[4].
4-Pyrazolecarboxylic acid, 5-methyl-3-(nitrophenyl)-1-phenyl-, 599[7].
$C_{17}H_{13}N_3O_5$ 3-Isoindazolecarboxylic acid, 1-(o-nitrobenzoyl)-, Et ester, 2496[8].
$C_{17}H_{13}N_3O_6$ Phthalide, 4-formyl-2-hydroxy-(?), p-nitrophenylhydrazone, acetate, 184[5].
$C_{17}H_{13}N_5O_7$ 3-Indolepropionitrile, picrate, 759[2]
$C_{17}H_{14}AlNO_4$ + H_2O, 717[7]
$C_{17}H_{14}BrNO$ 4(1)-Quinolone, 3-(α-bromobenzal)-2,3-dihydro-6-methyl-, 205[7]
$C_{17}H_{14}Br_2Cl_2O$ 3-Pentanone, 1,2-dibromo-4,5-dichloro-1,5-diphenyl-, 2996[9]
$C_{17}H_{14}Br_2OS$ 4-Thiochromanone, 3-bromo-3-(α-bromobenzyl)-6-methyl-, 203[6]
$C_{17}H_{14}Br_2O_3S$ 1,4-Thiopyrone, 3,5-dibromotetrahydro-2,6-diphenyl-, S-dioxide, 200[9]
$C_{17}H_{14}ClNO_3$ Oxazinol, (chlorophenyl)methoxyphenyl-, 3168[6].
$C_{17}H_{14}Cl_2O$ Δ^1-3-Pentenone, 4,5-dichloro-1,5-diphenyl-, 2996[8].
$C_{17}H_{14}Cl_2O_2$ 1,5-Pentanedione, 1,5-bis(p-chlorophenyl)-, 1229[9]
$C_{17}H_{14}N_2O$ Ketone, methyl 4-methyl-2-(2-naphthyl)-5-pyrimidyl, 206[5]
Pyrazole, 1-benzoyl-3(or 5)-methyl-5(or 3)-phenyl-, 2856[9]
Quinazolone, methyl-2-styryl-, 207[1,?]
Quinoline, 4-acetamido-2-phenyl-, 3011[3]
$C_{17}H_{14}N_2OS_2$ Rhodanine, 5-(anilinomethylene)-3-p-tolyl-, 600[7]
4(5)-Thiazolone, 5-(anilinomethylene)-2-(benzylmercapto)-, 600[7].
$C_{17}H_{14}N_2O_2$ Leucoisoindigotin, methyl-, 3455[9]
1-Naphthalenecarbamic acid, o-aminophenyl-, 2319[?].
Propiolic acid, phenyl-, anisalhydrazide, 2157[3].
4-Pyrazolecarboxylic acid, 5-methyl-1,3-diphenyl-, 599[7]
$C_{17}H_{14}N_2O_2S_2$ Rhodanine, 5-(p-anisylaminomethylene)-3-phenyl-, 600[8]
$C_{17}H_{14}N_2O_3$ Isatin, methyl-, 3455[9]
4-Pyrazolecarboxylic acid, 5-methyl-1-phenyl-3-salicyl-, 599[7]
5-Pyrimidinecarboxylic acid, 1,4-dihydro-4-keto-2-(2-naphthyl)-, Et ester, 206[6].
$C_{17}H_{14}N_2O_4$ Isatide, 5-methyl-, 3455[9]
$C_{17}H_{14}N_2O_5S$ Cinnamonitrile, 3-methoxy-2(and 4)-nitro-α-p-tolylsulfonyl-, 402[8,9].
*$C_{17}H_{14}N_2O_6S$ Cinnamonitrile, α-(o-anisylsulfonyl)-3-methoxy-2-nitro-, 402[9].
—, 3-hydroxy-4-nitro-α-(p-phenetylsulfonyl)-, 402[7]
$C_{17}H_{14}N_4O_3$ Indazole, 2-acetyl-5-methyl-7-(p-aminobenzalamino)-(?), 2497[6].
$C_{17}H_{14}N_4O_2S$ Piperonal, thiocarbohydrazone, 1811[?]
$C_{17}H_{14}N_4O_8$ 1-Methylquinolinium 3-methoxypicrate, 1394[9].
1-Methylquinolinium 4,5,6-trinitroguaiacolate, 1395[1].
$C_{17}H_{14}N_4O_8S$ Thiazole, 5-ethoxy-2-phenyl-, picrate, 2679[8].
$C_{17}H_{14}N_4O_9$ 3-Indolepropionic acid, picrate, 795[2].
$C_{17}H_{14}N_4O_6S$ 1,2,3-Triazole-4-carboxamide, 5-hydroxy-1-m-nitrobenzalamino-N-p-tolylsulfonyl-, 1409[7].
$C_{17}H_{14}N_6O_2S$ Pseudoisatin, thiocarbohydrazone, dioxime, 1810[9].
$C_{17}H_{14}O$ 1-*meso*-Benzanthren-7-ol, 2,3-dihydro-, 1403[8].
Ether, benzyl naphthyl, 391[6], 3695[4].
3-Pentadienone, 1,5-diphenyl-, 403[2], 2096[7]; *and salts*, 180[4], 2162[9].
$C_{17}H_{14}OS$ 1-Naphthol, 1-(p-tolylmercapto)-, 3289[7].
1,4-Thiopyrone, 2,3-dihydro-2,6-diphenyl-, 199[9]
$C_{17}H_{14}O_2$ 9-Anthrol, 10-methyl-, acetate, 2677[7].
Flavone, 3,6-dimethyl-, 1237
Isoflavone, 2,6-dimethyl-, 1237[8].
2-Naphthol, 7-benzyloxy-, 911[1].
$C_{17}H_{14}O_3$ Coumarin, methoxy-4-methyl-3-phenyl-, 595[6,7].
Isoflavone, 7-methoxy-2-methyl-, 196[?]
$C_{17}H_{14}O_3S$ 4-Thiochromanone, 3-benzal-6-methyl-, S-dioxide, 198[2].
$C_{17}H_{14}O_4$ Acrylic acid, β-p-phenoxybenzoyl-, Me ester, 593[3].
Anthrone, 4-hydroxy-3-methoxy-, acetate, 411[6]
4-Chromanone, 3-anisal-7-hydroxy-, 605[5]
Chromone, 3-benzyldihydroxy-2-methyl-, 197[1,?]
—, 3,7-dihydroxy-2-phenethyl-, 196[8]
Flavone, 5,7-dimethoxy-, 1996[9]
1-Isobenzofurancarboxylic acid, 1,2-dihydro-2-keto-1-phenyl-, Et ester, 1226[6]
$C_{17}H_{14}O_5$ Benzophenone, 2,3,4-trihydroxy-, 3,4-diacetate, 1052[9]
Chrysin, dimethoxy-, 195[9], 196[5].
$C_{17}H_{15}Br$ Anthracene, 9-bromo-10-isopropyl-, 3003[7]
$C_{17}H_{15}BrINO_2S$ 3-(p-Bromophenylsulfonyl)-1-methylquinaldinium iodide, 1626[?]
$C_{17}H_{15}BrN_2$ $\Delta^{1,3}$-Pentadienylamine, p-bromo-N-phenyl-ε-phenylimino-, *HBr*, 741[9]
$C_{17}H_{15}Br_5$ Anthracene, 1,2,3,4,9-pentabromo-1,2,3,4-tetrahydro-10-isopropyl-, 3003[8].
$C_{17}H_{15}ClN_2$ Pyrazole, 5-(o-chlorophenyl)-3-methyl-1-o-tolyl-(?), 762[3]
$C_{17}H_{15}ClO_3$ Propionic acid, (chlorobenzoyl)phenyl-, methyl ester, 3168[4]
$C_{17}H_{15}ClO_4$ 2-(3,4-Dimethoxyphenyl)-7-hydroxybenzopyrylium chloride, *and $FeCl_3$ compd.*, 3456[7]
7-Hydroxy-2-(4-hydroxyphenyl)-3-methoxy-5-methylbenzopyrylium chloride, *and $FeCl_3$ compd.*, 3297[8]
Propionic acid, (chlorobenzoyl)hydroxyphenyl-, methyl ester, 3168[4].
$C_{17}H_{15}ClO_5$ 7-Methoxy-2-methyl-4-phenylbenzopyrylium perchlorate, 2499[1]
$C_{17}H_{15}Cl_4FeO_2$ 2-(3,4-Dimethoxyphenyl)benzopyrylium ferrichloride, 3456[6]
$C_{17}H_{15}Cl_4FeO_3$ 2-(3,4-Dimethoxyphenyl)-7-hydroxybenzopyrylium chloride, $FeCl_3$ compd., 3456
$C_{17}H_{15}IN_4O_2$ 2-Formyl-1-methylquinolinium iodide, p-nitrophenylhydrazone, 1627[8].
$C_{17}H_{15}N$ Quinoline, dimethyl-2-phenyl-, *and salts*, 418[7]
$C_{17}H_{15}NO$ Lepidine, methoxy-2-phenyl-, *and salts*, 418[?]
2-Naphthol, 1-p-toluino-, 191[4]
4(1)-Quinolone, 3-benzal-2,3-dihydro-6-methyl-, 205[7]
$C_{17}H_{15}NO_2$ Acetanilide, m(and p)-(β-benzoylvinyl)-, *and salts*, 2156[7,8,9].
Compd. from 2-(γ-bromopropyl)-3-hydroxy-3-phenylphthalimidine, m. 126-8°, 1408[7].
$C_{17}H_{15}NO_2S$ Quinaldine, 3-p-tolylsulfonyl-, 1626[6].

$C_{17}H_{15}NO_3$ Benzil, α-oxime, propionyl deriv., 1230[5].
Formanilide, *p*-(β-anisoylvinyl)-, *perchlorate*, 2156[9].
p-Toluic acid, 3-cinnamylamino-, 398[2]
$C_{17}H_{15}NO_3S$ Quinaldine, 3-(anisylsulfonyl), *and salts*, 419[1,2,3].
$C_{17}H_{15}NO_4$ Anisic acid, 3-cinnamylamino-, 398[2]
Isatic acid, *N*-benzoyl-, Et ester, 2997[8]
$C_{17}H_{15}NO_5$ 7-Methoxy-2-methyl-4-phenylbenzopyrylium nitrate, 2499[1].
$C_{17}H_{15}NO_6$ *p*-Toluic acid, α-hydroxy-3-nitro-, Et ester, benzoate, 379[1].
$C_{17}H_{15}NO_6U$ Pyridine dipyrocatecholuranate, 557[1].
$C_{17}H_{15}NO_8U$ Pyridine dipyrogalloluranate, 557[1]
$C_{17}H_{15}N_3O$ Pyrrole, (*p*-anisylazo)-2-phenyl-, 1078[7].
4(3)-Quinazolone, 2-methyl-3-(α-methylbenzalamino)-, 207[1]
$C_{17}H_{15}N_3OS$ 1,3,4-Isothiodiazine, 5-phenyl-2-phenylamino-, Ac deriv., 116[2]
2(3)-Thiazolone, 3,4-diphenyl-, acetylhydrazone, *HBr*, 116[2]
$C_{17}H_{15}N_3O_3$ 1-Phthalazineacetic acid, 2,4-dihydro-4-hydroxy-2-(*p*-nitrophenyl)-, Me ester, 1803[1]
$C_{17}H_{15}N_3O_6$ Creosol, 3,5-dinitro-, quinoline salt, 3449[8]
$C_{17}H_{15}N_5$ Cinchoninaldehyde, 2-phenyl-, aminoguanidone, *HNO*, 2857[1]
$C_{17}H_{15}N_5O_4S$ 1,2,3-Triazole-4-carboxamide, 1-benzalamino-*N*-benzylsulfonyl-5-hydroxy-, 1409[1]
—, 1-benzalamino-5-hydroxy-*N*-*p*-tolylsulfonyl-, 1409[1]
$C_{17}H_{15}N_5O_5S$ 1,2,3-Triazole-4-carboxamide, *N*-benzylsulfonyl-5-hydroxy-1-salicylalamino-, 1409[1]
—, 5-hydroxy-1-salicylalamino-*N*-*p*-tolylsulfonyl-, 1409[1]
$C_{17}H_{15}N_5O_7$ Pyrazole, 1-benzyl-3(and 5)-methyl-, picrate, 3006[1]
—, dimethylphenyl-, picrate, 2493[4], 2856[6].
$C_{17}H_{15}N_5O_9$ 2-Indazoleacetic acid, Et ester, picrate, 1622[8].
$C_{17}H_{16}$ Anthracene, 9-isopropyl-, 3003[7].
$C_{17}H_{16}BrIN_2O_2S$ 2-Amino-3-(*p*-bromophenylsulfonyl)-1-ethylquinolinium iodide, 1626[9]
$C_{17}H_{16}BrNO_2$ Phthalimidine, 2-(γ-bromopropyl)-3-hydroxy-3-phenyl-, 1408[2].
$C_{17}H_{16}BrN_3O_4$ Piperidine, 1-[4-(4-bromo-2-nitrophenyl)-2-nitrophenyl]-, 1614[8]
$C_{17}H_{16}ClNO_3S$ Quinoline, 3-chloro-1,4-dihydro-6-methoxy-1-*p*-tolylsulfonyl-, 205[8].
4(1)-Quinolone, 3-chloro-5(6 and 7)-methyl-1-*p*-tolylsulfonyl-, 205[6,7].
$C_{17}H_{16}ClNO_4$ Propionic acid, (chlorobenzoyl)-hydroxyphenyl-, methyl ester, oxime, 3168[4].
$C_{17}H_{16}ClN_3O_4$ Piperidine, 1-[4-(4-chloro-2-nitrophenyl)-2-nitrophenyl]-, 1614[8]
$C_{17}H_{16}Cl_2O_2$ Propene, 1,3-di-*p*-anisyl-1,3-dichloro-, 403[1].
$C_{17}H_{16}N_2$ $\Delta^{1,3}$-Pentadienylamine, *N*-phenyl-5-phenylimino-, *di-HI*, 742[1].
Quinoline, 4-(β-aminoethyl)-2-phenyl-, 3010[7]; *and derivs.*, 1413[3,4].
$C_{17}H_{16}N_2O$ Benzamide, *N*-[*p*-(cyanomethyl)-phenethyl]-, 391[8].
2-Furan-α,γ,ε-heptatrienaldehyde, phenylhydrazone, 1235[7].
$C_{17}H_{16}N_2O_3$ Cinnamic acid, α-acetyl-, phenylhydrazone, 2495[5].
3-Indolecarbinol, 1-acetyl-α-anilino-, *-HCl*, 758[7].
Δ^2-4-Pyrazolinecarboxylic acid, 3-methyl-1,5-diphenyl-, 2495[6].
$C_{17}H_{16}N_2O_3$ Glyoxime, methylphenyl-, mono-Me ether, Bz deriv., 747[1]
$C_{17}H_{16}N_2O_3S$ Quinoline, 2-amino-8-methoxy-3-*p*-tolylsulfonyl-, 402[9]
$C_{17}H_{16}N_2O_4$ Benzoic acid, 5-acetamido-2-(*p*-acetamidophenyl)-, 1806[1].
Isatic acid, *N*-benzoyl-, Et ester, oxime, 2997[8].
Propionic acid, α,β-dibenzamido-, 2983[1]
$C_{17}H_{16}N_2O_4S$ Quinoline, 2-amino-3-(*o*-anisylsulfonyl)-8-methoxy-, 402[9]
$C_{17}H_{16}N_2O_6$ *p*-Toluic acid, α-hydroxy-3-nitro-, Et ester, carbanilate, 379[1].
o-Toluidine, 4,5-dimethoxy-3-nitro-*N*-piperonylidene-, 3449[9]
$C_{17}H_{16}N_2O_8$ 1-Naphthalenemalonic acid, 2,4-dinitro-, di-Et ester, 2325[1]
$C_{17}H_{16}N_4O_7S$ Trimethylamine, α-2-furyl-α′-2-thienyl-, picrate, 390[7].
$C_{17}H_{16}N_4O_{11}$ Meconin, 2-(aminomethyl)-, picrate, 2330[9]
$C_{17}H_{16}O$ γ-Pentenophenone, β-phenyl-, 1592[4].
$C_{17}H_{16}OS$ 1,4-Thiopyrone, tetrahydro-2,6-diphenyl-, 199[1].
$C_{17}H_{16}O_2$ Chalcone, α-ethoxy-, 2156[8]
Cyclobutanecarboxylic acid, 2,4-diphenyl-, 1392[1].
1,5-Pentanedione, 1,5-diphenyl-, 1229[2].
Δ^2-1-Propenol, 1,3-diphenyl-, acetate, 906[7].
$C_{17}H_{16}O_2S$ 1,4-Thiopyrone, tetrahydro-2,6-diphenyl-, *S*-oxide, 200[2].
$C_{17}H_{16}O_3$ Chalcone, 4,4′-dimethoxy-, *addn. compds.*, 403[3,5]
Cyclobutanecarboxylic acid, 3-hydroxy-2,4-diphenyl-, 1391[5].
$C_{17}H_{16}O_3S$ 1-Propanol, γ-mercapto-, dibenzoate, 737[3]
1,4-Thiopyrone, tetrahydro-2,6-diphenyl-, *S*-dioxide, *and* H_2O_2 *addn. compd.*, 200[1]
$C_{17}H_{16}O_4$ Acetic acid, (*p*-benzoylphenoxy)-, Et ester, 2158[8]
Benzil, 2,4′-dimethoxy-6-methyl-, 409[9].
Benzophenone, 4-hydroxy-3-methoxy-2′-methyl-, acetate, 402[1]
Chalcone, 2-hydroxy-3′,4′-dimethoxy-, 3456[8]
Lactic acid, β-phenyl-, Me ester, benzoate, 751[2]
Mandelic acid, Et ester, benzoate, 378[2].
Phenolglutarein, 2676[7]
Propionic acid, β-*p*-phenoxybenzoyl-, Me ester, 593[3]
$C_{17}H_{16}O_5$ Chalcone, 2′,4′-dihydroxy-4,6′-dimethoxy-, 375[5]
$C_{17}H_{17}AsN_2O_5$ Arsanilic acid, *N*-(3-acetamido-4-hydroxybenzoyl)-, acetate, 394[8].
$C_{17}H_{17}BrN_2$ 1-Indanone, 2-ethyl-, *p*-bromophenylhydrazone, 1620[1].
$C_{17}H_{17}BrN_4O_7$ Benzylamine, *N*-β-bromoallyl-*N*-methyl-, picrate, 390[2].
$C_{17}H_{17}ClN_2$ Δ^3-2-Butenone, 4-(*o*-chlorophenyl)-, tolylhydrazone, 762[3]
Δ^2-Pyrazoline, 5-(*o*-chlorophenyl)-3-methyl-1-*o*(and *p*)-tolyl-, 762[3].
$C_{17}H_{17}Cl_2NO_3$ Hydrocinnamamide, α,β-dichloro-*N*-vanillyl-, 404[9].
$C_{17}H_{17}IN_2$ 4-Amino-1-ethyl-2-phenylquinolinium iodide, 3010[9].
Pyrazole, 5-methyl-1,3-diphenyl-, methiodide, 2494[8].

$C_{17}H_{17}IN_2O_2S$ 2-Amino-1-methyl-3-*p*-tolylsulfonylquinolinium iodide, 1626^{7}.
$C_{17}H_{17}N$ Aporphine, 604^{6}.
$C_{17}H_{17}NO$ Benzamide, *N*-(5,6,7,8-tetrahydro-1-naphthyl)-, 1627^{6}.
$C_{17}H_{17}NO_2$ (See also *Apomorphine.*)
Cyclobutanecarboxylic acid, 3-amino-2,4-diphenyl-, *and -HCl*, 1391^{5}, 1392^{1}.
Phenethylamine, methyl-*N*-piperonylidene-, 1794^{5,6}.
$C_{17}H_{17}NO_3$ Cinnamamide, *N*-vanillyl-, 404^{6}.
Hydrocinnamolhydroxamic acid, *α*-methyl-, benzoate, 592^{7}.
$C_{17}H_{17}NO_3S$ 4(1)-Quinolone, 2,3-dihydro-5(6,7 and 8)-methyl-1-*p*-tolylsulfonyl-, 205^{6,7}.
$C_{17}H_{17}NO_4$ Acetic acid, (*p*-benzoylphenoxy)-, Et ester, oxime, 2158^{6}.
Alanine, *N*-benzoyl-*β*-methoxy-*β*-phenyl-, 3450^{7}.
1-Butanol, 4-phenyl-, *p*-nitrobenzoate, 1610^{6}.
Norboldine, *and -HI*, 1406^{1}.
$C_{17}H_{17}NO_4S$ 4(1)-Quinolone, 2,3-dihydro 6-methoxy-1-*p*-tolylsulfonyl-, 205^{8}.
$C_{17}H_{17}N_3O$ 1-Indanone, 2-benzyl-, semicarbazone, 419^{6}.
$C_{17}H_{17}N_3O_2$ Anthranilic acid, *N*-acetyl-, *β*-(*α*-methylbenzal)hydrazide, 207^{1}.
$C_{17}H_{17}N_3O_6$ Piperonal, (4,5-dimethoxy-3-nitro-*o* tolyl)hydrazone, 3449^{6}.
$C_{17}H_{17}N_5O_7$ 3-Indolepropylamine, picrate, 759^{3}.
$C_{17}H_{18}$ 1-*meso*-Benzanthrene, 2,3,8,9,10,11-hexahydro-, 1403^{7}.
$C_{17}H_{18}Br_4N_2S$ Benzothiazole, 1-dimethylanilino-3,5(and 3,6)-dimethyl-, tetrabromide, 2858^{6,7}.
$C_{17}H_{18}Br_6N_2S$ Benzothiazole, 1-dimethylanilino-3,5-dimethyl-, hexabromide, *HBr*, 2858^{6}.
$C_{17}H_{18}ClNO_2$ 2,8-Dimethoxy-10-ethylacridinium chloride, P 480^{2}.
$C_{17}H_{18}ClNO_3$ 2,8-Dimethoxy 10-hydroxyethylacridinium chloride, P 480^{2}.
$C_{17}H_{18}INO_2$ 6-Benzyloxy-3,4-dihydro-7-hydroxy-2-methylisoquinolinium iodide, 3011^{2}.
$C_{17}H_{18}N_2$ Δ^{3}-2 Butenone, 4-phenyl-, tolylhydrazone, 761^{6}.
1-Indanone, 2-ethyl-, phenylhydrazone, 1620^{1}.
Δ^{2}-Pyrazoline, 3 methyl-5 phenyl-1-o(and *p*)-tolyl-, 761^{8}, 762^{1}.
$C_{17}H_{18}N_2O$ 1,3-Butanedione, 1-phenyl-, 3-methylphenylhydrazone(?), 2856^{5}.
Δ^{3}-2-Butenone, 4-hydroxy-4-phenyl-, methylphenylhydrazone(?), 2856^{5}.
Cinnamaldehyde, *α*-ethoxy-, phenylhydrazone, 759^{7}.
$C_{17}H_{18}N_2O_4$ 1,2-Propanediol, dicarbanilate, 1787^{8}, 2650^{6}.
p-Toluidine, *N*-[2-ethoxy-3-methoxy-5(and 6)-nitrobenzal], 179^{1}.
$C_{17}H_{18}N_2O_5$ Chromone, 3-acetyl-2,6-dimethyl-, dioxime, diacetate, 1411^{5}.
Hydrocinnamamide, *p*-nitro-*N*-vanillyl-, 404^{9}.
$C_{17}H_{18}N_2S$ Benzothiazole, 1-dimethylanilino-3,5-(and 3,6-)-dimethyl-, 2858^{6,7}.
$C_{17}H_{18}N_4O_2S$ Anisaldehyde, thiocarbohydrazone, 1811^{1}.
$C_{17}H_{18}N_4O_6$ Benzaldehyde, 2,3-diethoxy 6-nitro-, *p* nitrophenylhydrazone, 179^{2}.
$C_{17}H_{18}N_4O_8S$ Benzoic acid, *p*-dimethylaminothiol-, Et ester, picrate, 371^{4}.
$C_{17}H_{18}N_4O_9$ Hydrocinnamic acid, *β*-amino-, Et ester, picrate, 3291^{9}.
$C_{17}H_{18}N_4O_{10}$ Serine, *β*-phenyl-, Et ester, picrate, 3450^{7}.
$C_{17}H_{18}N_4S$ Acetophenone, thiocarbohydrazone, 1811^{1}.
$C_{17}H_{18}O$ 1-*meso*-Benzanthrene-7-ol, 2,3,8,9,10,11-hexahydro-, 1403^{6}.
2-Butanone, 3-benzylphenyl-, 419^{6}, 589^{1}, 3000^{2}.
—, 3-methyl-1,1-diphenyl-, 3000^{2}.
$C_{17}H_{18}OS$ 4-Thioflavanol, 4,6-dimethyl-, 202^{1}.
$C_{17}H_{18}O_2$ Benzophenone, *p*-butoxy-, 2158^{6}.
Cumic acid, benzyl ester, 1793^{5}.
Cumic alcohol, benzoate, 2488^{2}.
Xanthydrol, 9-*sec*-butyl-, *and perchlorate*, 2328^{7}.
—, 9-isobutyl-, *and perchlorate*, 2328^{7}.
$C_{17}H_{18}O_2S$ Benzophenone, *p,p'*-diethoxythio-, 2977^{1}.
—, 4,4'-dimethoxy-3,3'-dimethylthio-, 2977^{1}.
1-Propanol, *γ*-(benzylmercapto)-, benzoate, 737^{3}.
$C_{17}H_{18}O_3$ Benzophenone, 4-ethoxy-3-methoxy 2'-methyl-, 402^{2}.
Isophorone, piperonylidene-, 1784^{4}.
Salicylic acid, thymol ester, 1030^{2}.
p-Toluic acid, *α*-ethoxy-, benzyl ester, 378^{6}.
$C_{17}H_{18}O_4$ 1-Indanol, 1-(2,4-dihydroxyphenyl)-5,6-dimethoxy-(?), 2326^{4}.
—, 1-(3-hydroxyphenoxy) 5,6-dimethoxy-(?), 2326^{4}.
Mandelic acid, *α*-*p*-anisyl-2-methoxy 6-methyl, 409^{6}.
$C_{17}H_{18}O_5S$ Benzenesulfonic acid, *o*-(4-hydroxy-5-isopropyl-*o*-toluyl)-, *and salts*, 1615^{3}.
$C_{17}H_{18}O_6$ 1,2-Benzopyran-3-carboxylic acid, 6-hydroxy-2-keto-5,7,8-trimethyl-, Et ester, acetate, 2320^{7}.
$C_{17}H_{18}O_5S_2$ 2 Propanone, 1-(anisylsulfonyl)-3-*p*-tolylsulfonyl-, 1625^{7,8}.
$C_{17}H_{18}O_7S_2$ 2-Propanone, 1,3-bis(*o*-anisylsulfonyl)-, 1625^{6}
$C_{17}H_{19}AsN_2O_7$ Carbanilic acid, 5-(*p*-arsonophenylcarbamyl)-2-methoxy-, Et ester, 394^{4}.
$C_{17}H_{19}N$ 1-Indanamine, *N*-benzyl-*N*-methyl-, 755^{9}
—, *N*-ethyl-*N*-phenyl-, 756^{1}.
—, *N*-xylyl-, 756^{1}.
$C_{17}H_{19}NO$ Isobutyramide, *N*-methyl-*β,β'*-diphenyl-, 3451^{6}.
$C_{17}H_{19}NO_2$ Benzophenone, *p*-butoxy-, oxime, 2158^{6}.
Cyclohexanol, 1-naphthalenecarbamate, 1232^{9},
Xylenol, 6-ethyl-, carbanilate, 2154^{4,5}.
$C_{17}H_{19}NO_2S$ 3-Pyrrolecarboxylic acid, 2,5-dimethyl-4-thioformyl-1-*p*-tolyl-, Et ester, 1235^{9}.
$C_{17}H_{19}NO_3$ (See also *Morphine; Piperine.*)
Acetic acid, [*p*-(*α*-aminobenzyl)phenoxy]-, Et ester, *-HCl*, 2158^{6}.
—, *α* (*α*-amino-*α* phenyl-*p*-toloxy)-, Et ester, 1400^{8}.
Hydrocinnamamide, *N*-vanillyl-, 404^{8}.
Phenethyl alcohol, *β*-imino-*p*-methoxy-*α*-(6-methyl-*o*-anisyl)-, *-HCl*, 409^{6}.
$C_{17}H_{19}NO_4S$ *β*-Alanine, *N*-tolyl-*N*-*p*-tolylsulfonyl-, 205^{6,7}.
$C_{17}H_{19}NO_5S$ *β*-Alanine, *N*-*p*-anisyl-*N*-*p*-tolylsulfonyl-, 205^{8}.
$C_{17}H_{19}NO_6W + H_2O$ Piperidine dipyrocatecholatotungstate, 3405^{6},

$C_{17}H_{19}NO_8$ 1,1,3,3-Propanetetracarboxylic acid, 2-phenylimino-, tetra-Me ester, 2861[4].
$C_{17}H_{19}NS$ Valeramide, *N*, *N*-diphenylthio-, 364[1].
$C_{17}H_{19}N_3O$ Acetaldehyde, di-*p*-tolyl-, semicarbazone, 2844[8].
2-Butanone, 1,1-diphenyl-, semicarbazone, 2997[8].
$C_{17}H_{19}N_3O_2$ Acetamidine, *N'* *p*-phenetyl-*N*-phenylcarbamyl-, 1218[6].
$C_{17}H_{19}N_3O_3$ Acetophenone, 3-ethyl-2-hydroxy 5 methyl-, *p*-nitrophenylhydrazone, 2154[9]
$C_{17}H_{20}N_2O$ Carbanilide, 2,3,2',3'-tetramethyl, 2666[5].
o-Propionotoludide, *β*-*o*-toluino, 205[6]
$C_{17}H_{20}N_2O_2$ 2-Pyrrolecarboxylic acid, 4-eth.l-3-methyl-5-(phenyliminomethyl), Et ester, *and* -*HCl*, 2160[6].
$C_{17}H_{20}N_2O_4$ 4-Isopyrrolecarboxylic acid, 2 [(4-carboxy - 3 - methyl-2-pyrryl)methylene] 3-methyl, diethyl ester, *and* -*HCl*, 3455[4].
$C_{17}H_{20}N_2S$ Benzophenone, *p*, *p'*-bis(dimethylamino)thio, 2977[1]
Carbanilide, tetramethylthio-, 2314[1]
$C_{17}H_{20}N_4O_3$ Xylose, phenylosazone, 2484[1]
$C_{17}H_{20}N_4O_8$ Phenethylamine, (ethoxymethyl), picrate, 391[6, 8]
$C_{17}H_{20}N_{12}O_{14}$ Guanidine, *α*-methyl-*α*,*α'*-ethylenebis, dipicrate, 3159[1].
Vitiatine, dipicrate, 3159[1].
$C_{17}H_{20}O$ 2-Butanol, 3-benzyl-4-phenyl-, 3000[2]
Δ^3-*s*-2-Spirohendecenone, 4-phenyl-, 3447[6]
$C_{17}H_{20}O_2$ Butane, 2 methyl-1,4 diphenoxy-, 2990[2].
2,3-Butanediol, 2-benzyl 1-phenyl, 3000[1].
—, 3-methyl-1,1-diphenyl-, 3000[2].
Camphor, 3-benzoyl-, 1788[7]
Piperitone, 7-salicylal, 3457[7].
$C_{17}H_{20}O_5$ 1,2-Benzopyran-3-carboxylic acid, 6,8-dihydro-3,6-diketo-5,7,8- trimethyl, Bu ester, 2320[7].
$C_{17}H_{20}O_6$ Malic acid, di Et ester, cinnamate, 1056[7].
$C_{17}H_{21}I_4N$ Dibenzyldimethylammonium iodide, CHI_3 addn. compd, 2815[8].
$C_{17}H_{21}NO$ Benzohydrylamine, *p*-butoxy, 1400[5]; -*HCl*, 2158[6].
2-Butanol, 3-amino-2 benzyl-1-phenyl-, 589[1].
1-Propanol, 2-amino-1,1 dibenzyl-, 2325[2].
$C_{17}H_{21}NO_2$ Camphorimide, *N*-tolyl-, 1800[7].
$C_{17}H_{21}NO_4$ See *Cocaine; Hyoscine; Pseudococaine; Scopolamine.*
$C_{17}H_{21}NO_5$ Aspartic acid, *N*-cinnamyl-, di-Et ester, 1056[9].
Camphoranilic acid, *m*(*o*- and *p*)-carboxy-, 187[3, 4].
Scopolamine, *N*-oxide, 1114[8].
$C_{17}H_{21}N_3O$ Spirodecenone, phenyl-, semicarbazone, 3447[9].
$C_{17}H_{21}N_3OS_2$ Isopropylxanthic acid, diphenylguanidine salt, 3098[4].
$C_{17}H_{21}N_3O_3$ Cyclohexanone, 2-(hydroxymethylene)-3,5-dimethyl-, benzoate, semicarbazone, 380[6].
$C_{17}H_{21}N_5O_7$ Indazole, 2-ethyl-4,5,6,7-tetrahydro-4,6-dimethyl-, picrate, 389[7].
Isoindazole, 1-ethyl-4,5,6,7-tetrahydro-4,6 dimethyl-, picrate, 389[7].
$C_{17}H_{21}NaO_6$ Malonic acid, (2,5-dihydro-2-hydroxy-5-keto-3,4,6-trimethylbenzal)-, di-Et ester, Na deriv., 2320[8].
$C_{17}H_{22}AsI$ Mesityldimethylphenylarsonium iodide, 898[4].
$C_{17}H_{22}IN$ Benzyldiethylphenylammonium iodide, 2815[8].
$C_{17}H_{22}N_2$ *m*-Toluidine 4,4'-isopropylidenebis-, P 3697[5].
$C_{17}H_{22}N_2O$ Benzohydrol, *p*, *p'*-bis(dimethylamino)-, 1627[6].
Lepidine, 2-(piperidylethoxy)-, P 1304[6].
Urea, *β*-1-naphthyl-*α*, *α*-dipropyl-, 2319[5].
$C_{17}H_{22}N_2O_2$ 4-Pyrazolecarboxylic acid, 3-hexyl-5-methyl-1-phenyl-, 599[7].
2-Pyrrolecarboxylic acid, 5-(anilinomethyl)-4-ethyl-3-methyl-, Et ester, 2160[6].
$C_{17}H_{22}N_2O_4$ Glutaric acid, *α*-(2-ketocyclohexyl), 1989[4].
Pyrrolecarboxylic acid, 5,5'-methylenebis[4-ethyl 3-methyl-, 2863[5].
—, 2,2'-methylenebis[4-methyl-, di-Et ester, 2159[8]
$C_{17}H_{22}N_2O_5$ Camphoramic acid, *N*-(*m*-nitrobenzyl)-, 1800[7].
$C_{17}H_{22}N_2O_6$ Nipecotic acid, 1-ethyl-4-hydroxy-, Et ester, *p*-nitrobenzoate, -*HCl*, 3010[5].
$C_{17}H_{22}N_2O_6S$ Uraciltriacetylxylose, 2-ethylthio-, 1812[7].
$C_{17}H_{22}N_4O_3$ Camphor, 4-(*m*-nitrophenyl)semicarbazone, 175[6].
$C_{17}H_{22}N_4O_9$ 1,1'-Spirobipiperidine-4-carboxylic acid, *N*-hydroxy-, picrate, 385[6].
$C_{17}H_{22}N_6O_{10}S$ Arginine, N^{α}-methyl-, flavianate, 3691[1].
$C_{17}H_{22}N_8O_6$ Glycocyamidine, 5-(*δ*-aminobutyl)-, picrolonate, 3690[8]
$C_{17}H_{22}O_2$ Borneol, benzoate, 2998[4].
Isoborneol, benzoate, 2998[4].
$C_{17}H_{22}O_4$ Benzoic acid, *m*-[*β*-(*α*-hydroxyethylidene)-*γ*-ketohexyl]-, Et ester, 2843[4].
$C_{17}H_{22}O_6$ Malic acid, di-Et ester, hydrocinnamate, 1056[7].
Malonic acid, (2,5-dimethoxy-3,4,6-trimethylbenzal)-, di Me ester, 2320[8].
$C_{17}H_{23}NO$ Naphthalene, 4$_1$-benzamidodecahydro-, 1802[7].
$C_{17}H_{23}NO_2$ Isomenthone, oxime, Bz deriv., 751[8].
Menthone, oxime, Bz deriv., 751[8].
$C_{17}H_{23}NO_3$ (See also *Atropine; Hyoscyamine.*)
Camphoramic acid, *N*-benzyl-, 1800[7].
Camphoranilic acid, *m*(*o* and *p*)-methyl-, 1800[7].
γ-Pentenic acid, *δ*-anilino-*α*, *α*-diethyl-*β*-keto-, Et ester, 1590[7].
$C_{17}H_{23}NO_3S$ Ethyldimethylphenylammonium *p*-toluenesulfonate, 1795[5].
$C_{17}H_{23}NO_4$ Atropine, *N*-oxide, 1114[8].
Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, *p*-nitrobenzoate, 1399[2].
Hyoscyamine, *N*-oxide. 1114[8].
Nipecotic acid, 1 ethyl-4-hydroxy-, Et ester, benzoate, -*HCl*, 3010[5].
—, 4 hydroxy 1,4-dimethyl, Et ester, benzoate, -*HCl*, 1810[4]
$C_{17}H_{23}NO_5$ Aspartic acid, *N* hydrocinnamyl-, di-Et ester, 1056[9].
5 Desoxymorphinic acid, dihydro-, 2165[2].
$C_{17}H_{23}NO_6$ Morphinic acid, dihydro-, 2165[1].
$C_{17}H_{24}N_2O$ Butyrophenone, cyclohexenyl-, semicarbazone, 3447[8].
Cyclohexenone, diethylphenyl-, semicarbazone, 3447[9].
$C_{17}H_{24}$ Naphthalene, decahydrotolyl-, 1402[2].
$C_{17}H_{24}N_2O_3$ Bilirubic acid, 1815[9].
$C_{17}H_{24}N_2O_4$ Leucine, *N*-(*N*-benzoylglycyl)-, 1624[2].
Nipecotic acid, 1-ethyl-4-hydroxy-, Et ester, *p*-aminobenzoate, *di-HCl*, 3010[5].

$C_{17}H_{24}N_4O_6S$ 1,2,3-Triazole-4-carboxylic acid, 5-hydroxy-1-*p*-tolylsulfonyl-, Et ester, piperidine deriv., 1408[9].
$C_{17}H_{24}O$ Naphthalene, anisyldecahydro-, 1402[3].
$C_{17}H_{24}O_2$ Borneol, 3-methoxy-2-phenyl-, 2157[7].
$C_{17}H_{24}O_3$ Camphor, 3-(hydroxymethyl)-, sorbate, 1228[1].
$C_{17}H_{24}O_5$ Malonic acid, (benzyloxymethyl)ethyl-, di-Et ester, 581[9].
$C_{17}H_{25}NOS$ Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, thionocarbanilate, 1399[1].
$C_{17}H_{25}NO_2$ Cyclohexanol, 2-diethylamino-, benzoate, 2831[7].
Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, *p*-aminobenzoate, 1399[2].
3-*p*-Menthanecarboxanilide, 3-hydroxy-, 1070[9].
$C_{17}H_{25}NO_3$ Pelargonamide, *N*-piperonyl-, 404[9].
$C_{17}H_{25}NO_4S$ 4-Piperidinecarboxylic acid, 4-hydroxy-1,2,2,6,6-pentamethyl-, Me ester, 2-thiophenecarboxylate, *and salts*, 2854[7].
$C_{17}H_{25}NO_6$ Morphinic acid, tetrahydro-, 2165[4].
$C_{17}H_{25}N_3O_3$ Isocaproamide, α-(α-benzamidoacetamido)-*N*-ethyl-, 1624[2].
$C_{17}H_{26}N_2O_5S$ Leucine, *N*-(*N*-tolylsulfonylglycyl)-, Et ester, 3298[5].
$C_{17}H_{26}O$ Δ^3-2-Decenol, 2-benzyl-, 1602[3].
$C_{17}H_{26}O_2$ Cyclohexanol, 4-(4-hydroxy-α,α,3-trimethylbenzyl)-2-methyl-, P 3697[2]
$C_{17}H_{26}O_2S$ *p*-Toluenesulfinic acid, *l*-menthyl ester, 397[4].
$C_{17}H_{26}O_3$ Undecylophenone, 2,4-dihydroxy-, 2320[2]
$C_{17}H_{26}O_7$ Cyclopentanecarboxylic acid, dicarboxypropylketo-, triethyl ester, 3446
$C_{17}H_{26}O_{13}$ Arabinose, tetracarbethoxy-, 3285[2]
Xylose, tetracarbethoxy-, 3285[2]
$C_{17}H_{27}NO_2$ Pelargonamide, *N*-*p*-methoxybenzyl-, 405[1].
Triethylamine, β-(3-Δ^2-butenyl-*o*-anisyloxy)-, P 2392[8]
$C_{17}H_{27}NO_3$ Caproamide, α-isopropyl-*N*-vanillyl-, 404[8]
Pelargonamide, *N*-vanillyl-, 404[8]
$C_{17}H_{28}Cl_2O_2$ Monoacetate, b 190-200°, of the dichlorohydrin from caryophyllene, 1073[1]
$C_{17}H_{28}N_2O_2$ Benzoic acid, *p*-amino-, β-dibutylaminoethyl ester, β-di-*sec*-butylaminoethyl ester, and β-diisobutylaminoethyl ester, -*HCl*, 1852[8].
$C_{17}H_{28}N_4O_4$ 1,3-Propanediamine, 2-(2,4-dinitrophenyl)-*N*,*N*,*N'*,*N'*-tetraethyl-, 1414[2,3].
$C_{17}H_{28}O_2$ Resorcinol, 4-hendecyl-, 2320[3].
$C_{17}H_{29}NO$ Triethylamine, β-(α-isobutoxybenzyl)-, *and* -*HCl*, 1604[9].
$C_{17}H_{30}O$ Civetone, 1791[5].
7-Heptadecin-6-one, 1783[9].
$C_{17}H_{30}O_2$ Homohydnocarpic acid, 3160[8].
$C_{17}H_{30}O_4$ Malonic acid, cyclohexylbutyl-, diethyl ester, 3160[2]
$C_{17}H_{32}Cl_3N_{12}Pt$. + *n* H_2O, 2626[2].
$C_{17}H_{32}O$ Cycloheptadecanone, 1791[8], 1792[5], 2151[6]
$C_{17}H_{32}O_2$ Cyclohexaneundecylic acid, 1599[2], 3160[5].
Cyclohexanol, 4,4'-isopropylidenebis[2-methyl-, P 3697[3].
2,4-Heptadecanedione, 738[9].
Hydnocarpic acid, dihydro-, Me ester, 172[3].
$C_{17}H_{32}O_3$ Cyclohexanecapric acid, hydroxy-, methyl ester, 3160[9].
Cyclohexaneundecylic acid, θ-hydroxy-, 1599[2].
Hydnocarpic acid, dihydro-ι-hydroxy-, Me ester, 1599[1].
$C_{17}H_{32}O_4$ Brassylic acid, di-Et ester, 1789[3].
1,15-Pentadecanedicarboxylic acid, 1789[8], 1791[9].
1,13-Tridecanedicarboxylic acid, di-Me ester, 1789[3].
$C_{17}H_{33}NO$ Cycloheptadecanone, isoxime and oxime, 1791[9].
Lauric acid, piperidide, 2845[1].
$C_{17}H_{33}N_3O$ Cyclohexadecanone, semicarbazone, 1792[5].
$C_{17}H_{34}$ Cycloheptadecane, 2151[5].
$C_{17}H_{34}OS_2$ Cetylxanthic acid, 3158[8].
$C_{17}H_{34}O_2$ Acid, m 73-5°, from sterol ester of *Hevea* resin, 3099[9].
$C_{17}H_{35}NO_2$ Margaric acid, π-amino-, -*HCl*, 1791[9].
$C_{17}H_{36}O_2$ Pentadecane, 1,15-dimethoxy-, 1789[4]
$C_{18}Fe_7N_{18}$ See *Iron ferrocyanides; Prussian blue*).
$C_{18}Fe_3N_{18}Sb_4$ See *Antimony ferrocyanide*.
$C_{18}H_6Cl_6O_4$ Quinone, 2,6-bis(2,4,6-trichlorophenoxy)-, 2318[9].
$C_{18}H_8Cl_2O_2S$ Indone, 2,2'-thiobis[3-chloro-, *and SnCl_4 addn compd*, 3002[3,4].
$C_{18}H_8Cl_2O_4$ Muconic acid, α,δ-bis(*p*-chlorophenyl)-β,γ-dihydroxy-, dilactone, 2849[8].
$C_{18}H_8Cl_6O_4$ Hydroquinol, 2,6-bis(2,4,6-trichlorophenoxy)-, 2319[1].
$C_{18}H_8O_2$ Truxenedione, 3002[3], 3003[1]
$C_{18}H_8O_2S_2$ 10,12-Diindenodithiindione, *and SnCl_4 compd.*, 3002[3,4]
$C_{18}H_9Cl_4NO_3$ Quinone, 2-anilino-3-chloro-5-(2,4,6-trichlorophenoxy)-, 2318[9].
$C_{18}H_9N_3O_2$ 4,5-Acenaphthotriazoledione, 8-phenyl-, 1081[3].
$C_{18}H_9N_7O_{12}$ Triphenylamine, hexanitro-, 2834[7].
$C_{18}H_{10}Cl_2N_2O_2$ Muconomitrile, α,δ-bis(*p*-chlorophenyl)-β,γ-dihydroxy-, 2849[8].
$C_{18}H_{10}Cl_2O_6$ Muconic acid, α,δ-bis(*p*-chlorophenyl)-β,γ-dihydroxy-, monolactone, 2849[8].
$C_{18}H_{10}Cl_4O_7$ Phthalide, 3,4,5,6-tetrachloro-2-hydroxy-2-salicyl-, diacetate, 596[5].
$C_{18}H_{10}IN_5O_{11}$ Bis(*m*-nitrophenyl)iodonium picrate, 585[6].
$C_{18}H_{10}N_2O$ 7-Benzimidazobenzisoquinolinone, 1075[5].
12-Isoindolonaphthimidazolone, 1075[7].
$C_{18}H_{10}N_4$ 2,3-β-Quinoxalophenazine, 2837[1].
$C_{18}H_{10}N_4O_8S_2$ Benzene, *m*-bis(2,4-dinitrophenylmercapto)-, 3163[2].
$C_{18}H_{10}OS_2$ 7,2'-Spiro[acenaphthene-1,3-benzodisulfole]-8-one, 1797[7].
$C_{18}H_{10}O_2S_2$ 3,3'-Bithiochromone, 203[5].
$C_{18}H_{10}O_3$ $\Delta^{2,2'}$-Biindan-1,3,1'-trione, 911[5].
$C_{18}H_{11}BrO_3$ 1-Indanone, 4-bromo-6,7-methylenedioxy-, piperonylidene deriv., 3292[3].
$C_{18}H_{11}Br_3$ Naphthalene, dibromo-1-(α-bromostyryl)-, 1402[1].
$C_{18}H_{11}ClN_2O_6$ Benzene, 1-chloro-2,4-dinitro-3,5-diphenoxy-, 1222[8].
$C_{18}H_{11}Cl_2NO_4$ Muconamic acid, α,δ-bis(*p*-chlorophenyl)-β,γ-dihydroxy-, lactone, 2849[7].
$C_{18}H_{11}Cl_4NO_3$ Compd., m. 156°, from 2-anilino-3-chloro-5-(2,4,6-trichlorophenoxy)quinone, 2318[9].
$C_{18}H_{11}NO_2$ 3,4-Benzacridine-12-carboxylic acid, 597[9].
2(1)-β-Naphthofuranone, 1-phenylimino-, 597[9].

$C_{18}H_{11}NO_3$ Compd., m. 203°, from merolignin, 422[8].
3,4-Furandicarboximide, 2,5-diphenyl-, 386[3].
3,4-Pyrroledicarboxylic anhydride, 2,5-diphenyl-, 386[9].
$C_{18}H_{11}N_3O_4$ 5,6-αβ-Naphthotriazoledicarboxylic acid, 2-phenyl-, 1081[4].
$C_{18}H_{11}N_5$ 2,3-α-Quinoxalophenazine, 6-amino-, 2842[6].
$C_{18}H_{11}N_5O_8$ Triphenylamine, tetranitro-, 2834[7].
$C_{18}H_{12}$ 1,2-Benzanthrene, 2455[6].
Naphthalene, 2-phenylethinyl-, 1401[7].
Truxene, 3002[4], 3003[1].
$C_{18}H_{12}Ag_2O_6Sn$ Silver tripyrocatecholatostannate, 3404[2].
$C_{18}H_{12}Al_2O_6Sn$ + $30H_2O$ Aluminum tripyrocatecholatostannate, 3404[2].
$C_{18}H_{12}BaO_6Sn$ Barium tripyrocatecholatostannate, 3404[2]
$C_{18}H_{12}BiCl_2N_3O_6$ Bismuthine, tris-(p-nitrophenyl)-, dichloride, 1063[6], 1984[6].
$C_{18}H_{12}BiN_3O_6$ Bismuthine, tris-(p-nitrophenyl)-, 1063[6], 1984[6].
$C_{18}H_{12}BiN_5O_{12}$ Bismuthine, tris(nitrophenyl), dinitrate, 785[6], 1063[6], 1984[6].
$C_{18}H_{12}BrN_3$ Acenaphthotriazole, 8-(p-bromophenyl)-4,5-dihydro-, 1081[?].
$C_{18}H_{12}CaO_6Sn$ Calcium tripyrocatecholatostannate, 3404[?].
$C_{18}H_{12}ClN_3$ Acenaphthotriazole, 8-(p-chlorophenyl)-4,5-dihydro-, 1081[?].
$C_{18}H_{12}ClN_3O_7$ Acenaphthene, 2-chloro-, picrate, 411[1].
$C_{18}H_{12}ClN_3O_8$ 2-Acetonaphthone, α-chloro-, picrate, 411[1].
$C_{18}H_{12}Cl_2O$ 1-Naphthaleneacetyl chloride, α-chloro-α-phenyl-, 110[4].
$C_{18}H_{12}CoN_2O_2$ 8-Quinolinol, Co deriv., 399[?].
$C_{18}H_{12}CuN_2O_2$ 8-Quinolinol, Cu deriv., 399[?].
$C_{18}H_{12}FeN_2O_2$ 8-Quinolinol, Fe deriv., 399[?].
$C_{18}H_{12}K_2O_6Sn$ Potassium tripyrocatecholatostannate, 3404[?].
$C_{18}H_{12}K_3MnO_6$ + $3H_2O$, 717[6]
$C_{18}H_{12}MgN_2O_2$ 8-Quinolinol, Mg deriv., 399[?].
$C_{18}H_{12}MgO_6Sn$ Magnesium tripyrocatecholatostannate, 3404[?]
$C_{18}H_{12}N_2O$ Benzamide, N-(5-cyano-1-naphthyl)-, 1216[7].
$C_{18}H_{12}N_2O_2Zn$ 8-Quinolinol, Zn deriv., 399[?].
$C_{18}H_{12}N_2O_4$ Naphthalene, 2,4-dinitro-1-styryl-, 3001[8]
$C_{18}H_{12}N_2O_4S_2$ Benzene, m-bis(4-nitrophenylmercapto)-, 3163[?]
$C_{18}H_{12}N_2O_6$ Benzene, 1,5-dinitro-2,4-diphenoxy-, 2067[5].
$C_{18}H_{12}N_4O_6$ Triphenylamine, trinitro-, 2834[7].
$C_{18}H_{12}N_6$ Benzobitriazole, dihydrodiphenyl-, 2327[9], 2328[1].
$C_{18}H_{12}N_6O_4$ 3,3'-Bi[1,2,5-triazole]-4,4'-dicarboxylic acid, 1,1'-diphenyl-, *and Ba salt*, 2328[1].
$C_{18}H_{12}N_6O_6$ Diphenylamine, trinitrophenylazo-, 3239[1].
$C_{18}H_{12}N_6O_9S$ Benzenesulfonic acid, p-(p-2,4,6-trinitroanilinophenylazo)-, *Na salt*, 3239[1].
$C_{18}H_{12}N_6O_{11}$ Pyridine, 2(and 4)-(2,4-dinitrobenzyl)-, picrate, 204[4,6].
$C_{18}H_{12}O$ Compd., m. 115.5-6.5°, from C_6H_6, $AlCl_3$, and α-phenyl-1-naphthaleneacetyl chloride, 410[4].
$C_{18}H_{12}O_2$ Glyoxal, naphthylphenyl-, 1401[8].
2,2'-Spirobiindan-1,3-dione, 185[8].
Truxenediol, 3002[3,4].
$C_{18}H_{12}O_2S$ Diindeno[3,2,2',3']thiophene-10,11-diol, 10,11-dihydro-, 3002[4].
$C_{18}H_{12}O_2S_2$ $\Delta^{3,3'}$-Bi[thiochroman]-4,4'-dione, 203[3].
$C_{18}H_{12}O_3$ 7-*meso*-Benzanthrenone, hydroxymethoxy-, 411[6,7].
Fulgide, 6,7-diphenyl-, 1796[9].
2,3-β-Indenopyran-3,9(1,2)-dione, 1-phenyl-, 912[1].
$C_{18}H_{12}O_3S$ 2,6-p-Thioxanedione, 3,5-dibenzal-, 1796[9].
$C_{18}H_{12}O_4$ Naphthoic acid, 3-hydroxy-, benzoate, 910[3], 1233[4].
Quinone, 2,5-dihydroxy-3,6-diphenyl-, 1225[9]
$C_{18}H_{12}O_6$ Quinizarin, diacetate, 2853[8]
$C_{18}H_{12}O_6SnZn$ Zinc tripyrocatecholatostannate, 3404[2].
$C_{18}H_{12}O_7$ Tartaric anhydride, dibenzoate, 1789[4].
$C_{18}H_{13}BrO$ Ketone, α-bromobenzyl naphthyl, 1401[9], 1402[1]
$C_{18}H_{13}Br_3O_4$ Bischromone, hydrotribromide, 197[6].
$C_{18}H_{13}Cl$ Naphthalene, (α-chlorostyryl)-, 1401[9], 1402[1]
$C_{18}H_{13}ClO$ 1-Naphthaleneacetyl chloride, α-phenyl-, 110[4].
$C_{18}H_{13}Cl_3N_2O_4S_2$ m-Benzenedisulfonanilide, 4,?,6-trichloro-, 2841[8].
$C_{18}H_{13}NO$ 3,4-Benzacridine, 10-methoxy-, 598[1].
$C_{18}H_{13}NO_2$ Ketone, 2-hydroxy-1-naphthyl phenyliminomethyl, 3166[1].
4-Quinolineacrylic acid, 2-phenyl-, P 2167[9]; *and salts*, 1413[?].
Tetrophan, 1469[?]
$C_{18}H_{13}NO_3$ Picolinic acid, [1(and 2)-naphthoyl]-, Me ester, 764[7]
$C_{18}H_{13}NO_4$ 3,4-Pyrroledicarboxylic acid, 2,5-diphenyl-, 386[8]
$C_{18}H_{13}N_3$ Acenaphthotriazole, 4,5-dihydro-8-phenyl-, 1081[3]
$C_{18}H_{13}N_3O_2$ Azobenzene, p-(p-nitrophenyl)-, 587[2]
$C_{18}H_{13}N_3O_3$ 9,10-α-Benzophenazinediol, 5-acetamido-, 603[2]
$C_{18}H_{13}N_4NaO_5S$ Azo compd. from 3-amino-1-acenaphthenesulfonic acid and p-nitrophenyldiazonium chloride, 411[4].
$C_{18}H_{13}N_5O_4$ Diphenylamine, 2,4-dinitro-4'-phenylazo-, 1084[1], 3351[5].
$C_{18}H_{13}N_5O_9$ Pyridine, 2(and 4)-p-nitrobenzyl-, picrate, 204[3,6].
$C_{18}H_{14}$ Hydrocarbon, m. 203°, from cholesterol, 1241[9]
Terphenyl, 406[2]
$C_{18}H_{14}BNO_6$ Anthraquinone, 1-amino-, boroacetate, 1052[?].
$C_{18}H_{14}BrNO_2S$ Quinaldine, 3-(p-bromophenylsulfonyl)-α-ethylidene-, 1626[6]
$C_{18}H_{14}BrN_3$ 3-Acenaphthenamine, 2-(p-bromophenylazo)-, 1081[5]
$C_{18}H_{14}Br_2$ Dibromide, m. 217°, of hydrocarbon from cholesterol, 1241[9].
$C_{18}H_{14}CdN_6O_{20}$ + $3H_2O$, 720[2].
$C_{18}H_{14}ClFe_2N_6O_?$ + $8H_2O$, 1769[5].
$C_{18}H_{14}ClNO_2$ 1-Naphthalenecarbamic acid, 4-chloro-m-tolyl ester, 2319[4].
$C_{18}H_{14}ClN_3$ 3-Acenaphthenamine, 2-(p-chlorophenylazo)-, 1081[5].
$C_{18}H_{14}Cl_2$ Naphthalene, 1-(α,α-dichlorophenethyl)-, 1401[9]
$C_{18}H_{14}Cl_2N_2O_4S_2$ m-Benzenedisulfonanilide, 4,6-dichloro-, 2841[7].
$C_{18}H_{14}Cl_3NO$ 4-Quinolineethanol, 2-phenyl-α-(trichloromethyl)-, 1413[3].

$C_{18}H_{14}Hg$ Benzene, γ,γ'-mercuribis[propargyl-, 1054[3].
Toluene, β,β'-mercuribis[p-ethinyl-, 1054[3].
$C_{18}H_{14}HgO_2$ Anisole, β,β'-mercuribis[p-ethinyl-, 1054[3].
Benzene, γ,γ'-mercuribis[propargyloxy-, 1054[3].
$C_{18}H_{14}KNO_2$ Truxillimide, K deriv., 1391[9], 1392[7].
$C_{18}H_{14}K_2MoO_8 + H_2O$, 3405[8].
$C_{18}H_{14}NNaO_2$ Truxillimide, Na deriv., 1391[9], 1392[7].
$C_{18}H_{14}N_2O_2$ Benzaldehyde, oxime, 1-naphthalenecarbamyl deriv., 2319[8].
Indigotin, 7,7'-dimethyl-, *FeCl₃ compds.*, 414[5].
Isoindigotin, dimethyl-, 758[5], 3456[1].
2(1)-Naphthalenone, 1-(p-acetamidophenylimino)-, 191[1].
Phthalimide, N-[γ-(p-cyanophenyl)propyl]-, 392[1].
Triphenylamine, p-nitro-, 2834[8].
$C_{18}H_{14}N_2O_3$ Naphthalamic acid, N-(o-aminophenyl)-, *and Ag salt*, 1075[5].
Phthalamic acid, N-(1-amino-2-naphthyl)-, *and Ag salt*, 1075[7].
Quinazolone, methyl-2-(3,4-methylenedioxystyryl)-, 207[3,4].
$C_{18}H_{14}N_2O_4$ Mandelic acid, m-(2-hydroxy-1-naphthylazo)-, 2992[9].
4-Pyrazolecarboxylic acid, 5-methyl-3-(3,4-methylenedioxyphenyl)-1-phenyl-, 599[8].
$C_{18}H_{14}N_2O_6S$ Isoindigotinsulfonic acid, 7,7'-dimethyl-, *and salts*, 3456[1].
$C_{18}H_{14}N_2O_7S$ Cinnamonitrile, α-(o-anisylsulfonyl)-3(and 5)-hydroxy-4(and 2)-nitro-, acetate, 402[7,8].
$C_{18}H_{14}N_4$ Isopyrrole, 2,2'-(di-2-pyrrylacetylene)-bis-, *and di-HCl*, 1406[6,7].
$C_{18}H_{14}N_4O$ 4-Quinolinepropionyl azide, 2-phenyl-, 1413[6].
$C_{18}H_{14}N_4O_2$ Acenaphthenamine, (p-nitrophenylazo)-, 411[2], 1081[5].
$C_{18}H_{14}N_4O_4$ 5,5'-Bihydantoin, 3,3'-diphenyl-(?), 2313[1].
$C_{18}H_{14}N_4O_7$ 7-Acenaphthenamine, picrate, 410[9].
1-Benzylpyridinium picrate, 3008[9].
$C_{18}H_{14}O$ Ketone, benzyl naphthyl, 1401[8].
$C_{18}H_{14}O_2$ Ketone, α-hydroxybenzyl naphthyl, 1401[9], 1402[1].
2,2'-Spirobi[1,2-benzopyran], 3-methyl-, 3008[2].
1,2'-Spirobiindan-1',3'-dione, 3-methyl-, 185[8].
$C_{18}H_{14}O_3$ Cinnamic anhydride, 1612[7].
1-Naphthaleneglycolic acid, α-phenyl-, 410[6].
$C_{18}H_{14}O_4$ Chromone, 7-hydroxy-3-methoxy-2-styryl-, 196[1].
Coumarin, 6-hydroxy-4-methyl-3-phenyl-, acetate, 595[8].
2-Indanpropionic acid, 1,3-diketo-β-phenyl-, 911[9].
Isoflavone, 7-hydroxy-2-methyl-, acetate, 196[8].
Succinic acid, dibenzal-, 1796[9].
Umbelliferone, 4-methyl-3-phenyl-, acetate, 595[8].
$C_{18}H_{14}O_4S$ Cinnamic acid, α,α'-thiobis-, 1796[8].
$C_{18}H_{14}O_5$ Chromone, 5,7-dihydroxy-3-methoxy-2-styryl-, 196[3].
$C_{18}H_{14}O_6U + H_2O$ Uranium cinnamate (basic), 3139[7].
$C_{18}H_{14}O_6$ Anthraquinone, 1-hydroxy-2,7-dimethoxy-, acetate, 411[1].
$C_{18}H_{14}O_8$ Benzoic acid, 2,3,4-trihydroxy-, 4-benzoate, diacetate, 2489[2].
Tartaric acid, dibenzoate, *salts*, 1789[8].
$C_{18}H_{15}As_2Cl$ Biarsine, chlorotriphenyl-, 2994[1].
$C_{18}H_{15}As_3$ Triarsine, cyclic triphenyl-, 2994[6].
$C_{18}H_{15}BCs$ Borine, triphenyl-, Cs deriv., 2668[7].
$C_{18}H_{15}BK$ Borine, triphenyl-, K deriv., 2668[7].
$C_{18}H_{15}BLi$ Borine, triphenyl-, Li deriv., 2668[7].
$C_{18}H_{15}BNa$ Borine, triphenyl-, Na deriv., 2668[6].
$C_{18}H_{15}BO_3$ Phenyl borate, 1605[1].
$C_{18}H_{15}BRb$ Borine, triphenyl-, Rb deriv., 2668[7].
$C_{18}H_{15}BiN_2O_4$ Bismuthine, triphenyl-, dinitrate, 1984[6].
$C_{18}H_{15}BiN_2O_6$ Bismuthine, triphenyl-, dinitrate, 584[7].
$C_{18}H_{15}BrN_4O_3$ 3(2)-s-Tetrazinone, 1,2-diacetyl-4-(p-bromophenyl)-1,4-dihydro-6-phenyl-, 1084[8].
$C_{18}H_{15}BrO_5$ 1,4-Benzopyrone, 3-(6-bromopiperonyl)-7-methoxy-2-methyl-, 2679[8].
$C_{18}H_{15}ClO_6$ 2-(o-Hydroxystyryl)-3-methylbenzopyrylium perchlorate, 3008[2].
$C_{18}H_{15}ClSi$ Silicane, chlorotriphenyl-, 189[7].
$C_{18}H_{15}Cl_4FeO_3$ 7,8(and 8,9)-Dimethoxy-2,3-indeno-3,2-γ-benzopyrylium ferrichloride, 2326[4,5].
$C_{18}H_{15}N$ Quinoline, 2-phenyl-4-propenyl-, *and salts*, 2680[9], 2681[2].
Triphenylamine, 1223[1], 2834[7].
$C_{18}H_{15}NO$ Ketone, benzyl naphthyl, oxime, 1401[8].
Naphthalene, 1-phenyl-, acetamido deriv., 1401[6].
$C_{18}H_{15}NOS_2$ Rhodanine, 5-benzal-3-(2,5-xylyl)-, 1080[8].
$C_{18}H_{15}NO_2$ 1-Naphthalenecarbamic acid, benzyl ester, 1232[8]; tolyl ester, 2319[8].
4-Quinolinepropionic acid, 2-phenyl-, *and salts*, 1413[4,5].
Truxillimide, 1319[7], 1392[4].
$C_{18}H_{15}NO_3$ 1-Naphthalenecarbamic acid, anisyl ester, 2319[8].
4-Quinolinepropionic acid, 6-hydroxy-2-phenyl-, *and salts*, 1413[9].
$C_{18}H_{15}NO_4$ Benzoic acid, m-N-cinnamylacetamido-, 398[1].
$\Delta^{1,4}$-1-Pentadienone, 5-p-anisyl-1-(m-nitrophenyl)-, 749[8].
$C_{18}H_{15}NO_8W + H_2O$ Aniline dipyrocatecholatotungstate, 3405[8].
$C_{18}H_{15}N_3$ 3-Acenaphthenamine, 2-phenylazo-, 1081[1].
Xenylamine, 4'-phenylazo-, 585[6].
$C_{18}H_{15}N_3O_2$ α,β-Naphthotriazole, 4,5-dimethoxy-2-phenyl-, 2850[7].
$C_{18}H_{15}N_3O_4$ 3,4-Pyrazoledicarboxylic acid, 1-[p-(p-aminophenyl)phenyl]-5-methyl-, 599[1].
$C_{18}H_{15}N_3O_5$ 1-Phthalazineacetic acid, 2,4-dihydro-4-hydroxy-2-(p-nitrophenyl)-, acetate, 1803[1].
$C_{18}H_{15}N_3O_7S$ Phenol, 2,4-dinitro-, p-toluenesulfonate, C_5H_5N addn. compd., 2816[3].
$C_{18}H_{15}N_5O_2$ o-Phenylenediamine, 4-nitro-N1-(p-phenylazophenyl)-, 1084[8].
$C_{18}H_{15}N_5O_4$ Benzene, m-dinitro-, addn. compd. with p-phenylazoaniline, 1062[7].
$C_{18}H_{15}NaSn$ Stannane, triphenyl-, Na deriv., 1607[9].
$C_{18}H_{15}OP$ Phosphine oxide, triphenyl-, 415[8].
$C_{18}H_{15}O_3P$ Phenyl phosphite, 1605[8].
$C_{18}H_{15}Si$ Silicyl, triphenyl-, 189[8].
$C_{18}H_{16}As_2$ Biarsine, triphenyl-, 2994[1].

$C_{18}H_{16}B_2O_{12}$ Naphthazarin, diboroacetate, 1077[4].

$C_{18}H_{16}BrN_3O_{11}$ Isoapiol, 6-bromo-, picrate, 3450[2].

$C_{18}H_{16}Br_2O_4$ Propionic acid, α,β-dibromo-β-p-phenoxybenzoyl-, Et ester, 593[4].

$C_{18}H_{16}ClN_5$ Phenosafranine, amino-, 1084[6].

$C_{18}H_{16}Cl_2N_2O_2$ Indene, bisnitrosochloride, 383[2].

$C_{18}H_{16}Cl_2N_4NiO_4$ Glyoxime, chloro-p-tolyl-, Ni deriv., 1084[9].

$C_{18}H_{16}Cl_2O_2$ 1,6-Hexanedione, 1,6-bis(p-chlorophenyl)-, 1229[4].

$C_{18}H_{16}NO_3P$ Anilinodiphenoxyphosphonium oxide, 914[7].

$C_{18}H_{16}N_2O$ Urea, α-benzyl-β-1-naphthyl-, 2319[6].

$C_{18}H_{16}N_2O_2$ Acetanilide, m,p'-acetylenebis-, 2850[9].

Leucoisoindigotin, dimethyl-, 3456[2].

Δ[2]-Oxazoline, 4-benzoyl-5-ethylimino-2-phenyl-, 1623[5].

4-Pyrazolecarboxylic acid, 5-methyl-1,3-diphenyl-, Me ester, 2495[7].

—, 5-methyl-3-phenyl-1-p-tolyl-, 599[8].

5-Pyrimidinecarboxylic acid, 4-methyl-2-(2-naphthyl)-, Et ester, 206[9].

Quinazolone, 2-(p-methoxystyryl)-1(and 3)-methyl-, 207[2, 3].

4-Quinolinol, 2-phenyl-, ethylcarbamate, *and* -*HCl*, 3010[9].

$C_{18}H_{16}N_2O_2S$ Benzothiazole, acetoacetamidophenylmethyl-, 3822[3].

$C_{18}H_{16}N_2O_2S_2$ Bioxindole, dimercaptodimethyl-, 3455[1].

$C_{18}H_{16}N_2O_3$ 4-Pyrazolecarboxylic acid, 3-p-anisyl-5-methyl-1-phenyl-, 599[8].

$C_{18}H_{16}N_2O_4$ 1-Anthracenebicarbamic acid, di-Me ester, 410[7].

Isatide, 5,5'-dimethyl-, 3455[8].

9-Phenanthrenebicarbamic acid, di-Me ester, 410[7].

3-Pyrrolecarboxylic acid, 5-formyl-4-methyl-, ethyl ester, azlactone, 3455[3].

$C_{18}H_{16}N_2O_6$ Succinic acid, α,β-dibenzamido-, 48[8].

$C_{18}H_{16}N_2O_6S_2$ m-Benzenedisulfonanilide, 4,6-dihydroxy-, 2841[7].

$C_{18}H_{16}N_2O_8$ m,m'-Bibenzoic acid, 2,2'-dinitro-, di-Et ester, 3289[1].

4,4'-Bi-1,3-dioxolane, 2,2'-bis(o-nitrophenyl)-, 749[4].

4,4'-Bi-1,3-dioxolan-2-ol, 2'-(o-nitrophenyl)-2-(o-nitrosophenyl)-, 749[4].

Diphenic acid, 3,5'-dinitro-, di-Et ester, 1801[7].

$C_{18}H_{16}N_2S_2$ Aniline, p,p'-(m-phenylenedithio)bis-, *and SnCl₄ salt*, 3163[4].

$C_{18}H_{16}N_4$ Pyrrole, 2,2',2'',2'''-acetylenetetrakis-, 2683[8].

$C_{18}H_{16}N_4O_2S$ 1,3,4-Thiodiazole, 2,5-bis(N-acetylanilino)-, 2162[7].

$C_{18}H_{16}N_4O_3$ 3(2)-s-Tetrazinone, 1,2-diacetyl-1,4-dihydro-4,6-diphenyl-, 1084[7].

$C_{18}H_{16}N_4O_4$ 1,4-Piperazinedicarboxanilide, 2,5-diketo-, 915[4].

$C_{18}H_{16}N_4O_8$ Isoquinoline, 1,2,3,4-tetrahydro-2-methyl-6,7-methylenedioxy-1-(2,4,6-trinitrobenzyl)-, 3437[6].

$C_{18}H_{16}N_4O_8S$ Thiazole, 5-ethoxy-4-methyl-2-phenyl-, picrate, 2671[8].

$C_{18}H_{16}N_4O_9$ 1,3,4-Oxazine, 6-ethoxy-2-phenyl-, picrate, 2502[8].

$C_{18}H_{16}N_{10}S_2$ 1,3,4-Triazole, 2,2'-dithiobis[5-(benzalhydrazino)-, 2162[8].

$C_{18}H_{16}O_2$ Flavone, 3-ethyl-6-methyl-, 1237[7].

α,γ-Pentadienic acid, β,δ-diphenyl-, Me ester, 1592[4].

$C_{18}H_{16}O_2S$ Thiochromone, 3-α-methoxybenzyl-6-methyl-, 203[8].

$C_{18}H_{16}O_3$ Chromone, 3-benzyl-7-hydroxy-2,5-dimethyl-, 197[2].

1-Indanone, 2-(2,3-dimethoxybenzal)-, 2326[5].

—, 2-veratral-, 2326[4].

$C_{18}H_{16}O_4$ Acrylic acid, β-p-phenoxybenzoyl-, Et ester, 593[3].

Chromone, 7-hydroxy-3-methoxy-2-phenethyl-, 196[3].

Coumarin, 7,8-dimethoxy-4-methyl-3-phenyl-, 595[7].

Mandelic acid, Me ester, cinnamate, 378[7].

9,10-Phenanthrenediol, 9,10-dihydro-, diacetate, 1405[2].

Truxillic acid, 1066[9], 1391[1], 1392[2].

Truxinic acid, 1066[9], 2664[3].

$C_{18}H_{16}O_5$ Coumarin, 4-p-anisyl-5,7-dimethoxy-, 595[1].

Flavone, trimethoxy-, 1990[9].

$C_{18}H_{16}O_6$ Flavone, 5-hydroxy-3,7,2'-trimethoxy-, 195[9].

$C_{18}H_{16}O_6S_2$ 2,6-Thianthrenediol, 3,7-dimethoxy-, 9,10-disulfide, diacetate, 2681[5].

$C_{18}H_{16}S$ Thiophene, 2,4-dimethyl-3,5-diphenyl-, 592[4].

$C_{18}H_{16}Sn$ Stannane, triphenyl-, 1607[7].

$C_{18}H_{17}BO_7$ 1-Naphthol, 2,4-diacetyl-, boroacetate, 1052[9].

$C_{18}H_{17}BO_8$ 2-Acetonaphthone, 1,8-dihydroxy-, 1-boroacetate, 8-acetate, 1053[1].

$C_{18}H_{17}BrO_3$ 7,8-Dimethoxy-2-methyl-4-phenylbenzopyrylium bromide, 2499[1].

$C_{18}H_{17}ClN_6$ Triaminoaminophenylphenazonium chloride, 3239[3].

$C_{18}H_{17}ClO_3$ 7-Methoxy-2,3-dimethyl-4-phenylbenzopyrylium chloride, *and FeCl₃ compd.*, 3454[8].

$C_{18}H_{17}ClO_4$ 2-(3,4-Dimethoxyphenyl)-3-methoxybenzopyrylium chloride, *and FeCl₃ deriv.*, 3456[8].

$C_{18}H_{17}ClO_6$ 7-Methoxy-2,3-dimethyl-4-phenylbenzopyrylium perchlorate, 3454[8].

$C_{18}H_{17}ClO_7$ 6,7(and 7,8)-Dimethoxy-2-methyl-4-phenylbenzopyrylium perchlorate, 2499[1].

$C_{18}H_{17}Cl_2NO$ Anthrone, dichloro-10-diethylamino-, 755[4], 2492[9].

$C_{18}H_{17}Cl_4FeO_2$ 7-Methoxy-2,3-dimethyl-4-phenylbenzopyrylium chloride, FeCl₃ compd., 3454[8].

$C_{18}H_{17}Cl_4FeO_4$ 2-(3,4-Dimethoxyphenyl)-methoxybenzopyrylium chloride, FeCl₃ compd., 3456[8], 3457[1].

$C_{18}H_{17}IN_4O_2$ 1-Ethyl-2-formylquinolinium iodide, p-nitrophenylhydrazone, 1627[8].

2-Formyl-1,6-dimethylquinolinium iodide, p-nitrophenylhydrazone, 1627[7].

$C_{18}H_{17}N$ Lepidine, 6-ethyl-2-phenyl-, 418[9].

Quinoline, 4,5,8-trimethyl-2-phenyl-, 418[9].

$C_{18}H_{17}NO$ Lepidine, ethoxy-2-phenyl-, *and salts*, 418[6, 7, 8].

$C_{18}H_{17}NOS$ 2(1)-Quinolone, 3-(benzylmercapto)-1-ethyl-, 1627[4].

$C_{18}H_{17}NO_2$ 1,3-Propanediol, 2-(2-phenyl-4-quinolyl)-, 1991[8]; *and salts*, 2680[9], 2681[1].

$C_{18}H_{17}NO_3$ Acetanilide, p-(β-anisoylvinyl)-, 758[2]; *salts*, 2156[8].

Isopyrrole, 5-ethyl-3-methyl-2-phthalidene-4-propionyl (?), 1236[4].

2,3-Pyrrolisoquinoline-5,10-dione, 3-ethyl-1-methyl-2-propionyl-(?), 1236[4].
Truxillamidic acid, 1391[2], 1392[2,6]

$C_{18}H_{17}NO_3S$ Quinaldine, 3-[o(and p)-phenetylsulfonyl]-, *and salts*, 419[3,4].

$C_{18}H_{17}NO_4$ Hippuric acid, α-benzoyl-, Et ester, 1623[7].
4-Isopyrrolepropionic acid, 5-ethyl-3-methyl-2-phthalidene-(?), 1236[6].
Meconin, 2-(benzalaminomethyl)-, 2331[1,3].
2,3-Pyrrolisoquinoline-2-propionic acid, 3-ethyl - 5,10 - dihydro - 5,10 - diketo-1-methyl-(?), 1236[6].

$C_{18}H_{17}NO_6$ 7,8-Dimethoxy-2-methyl-4-phenylbenzopyrylium nitrate, 2499[1].
1,2-Propanedione, 1-(3,4-dimethoxyphenyl)-3-(3,4-methylenedioxyphenyl)-, 2-oxime, 1083[8].

$C_{18}H_{17}N_3O$ 4-Quinolinepropionic acid, 2-phenyl-, hydrazide, *and* ·*HCl*, 1413[5].

$C_{18}H_{17}N_3OS$ 1,4,3-Isothiodiazine, 5-phenyl-2-p-tolylamino-, Ac deriv., 416[4]
2(3)-Thiazolone, 3-methyl-4-phenyl-, anisalhydrazone, *and HBr*, 416[6]

$C_{18}H_{17}N_3O_2$ Ketone, 2-hydroxy-8-methoxy-3-quinolyl methyl, phenylhydrazone, 402[8]

$C_{18}H_{17}N_3O_4$ Acrylic acid, β-p-phenoxybenzoyl-, Me ester, semicarbazone, 593[4].

$C_{18}H_{17}N_3O_5$ 1-Phthalazineacetic acid, 2,4-dihydro-4-hydroxy-2-(p-nitrophenyl)-, Et ester, 1803[1].

$C_{18}H_{17}N_3S$ 2(3)-Thiazolone, 3,4-diphenyl-, isopropylidenehydrazone, *and HBr*, 416[7]

$C_{18}H_{17}N_5O_7$ Pyrazole, 1-ethyl-3(and 5)-methyl-5(and 3)-phenyl-, picrates, 2856[6,7].

$C_{18}H_{17}N_5O_9$ 2-Indazoleacetic acid, α-methyl-, Et ester, picrate, 1622[6]
3-Indolecarbinol, 1-acetyl-α-(aminomethyl)-, picrate, 758[9]

$C_{18}H_{18}$ Anthracene, tetramethyl-, 3003[6].
Retene, 1320[8].

$C_{18}H_{18}IN_3O_7$ Pyrazole, 1-benzyl-3(and 5)-methyl-, methiodide, picrate, 3008[4]

$C_{18}H_{18}N_2$ Lepidine, 6-dimethylamino-2-phenyl-, 118[9]

$C_{18}H_{18}N_2O$ Quinoline, 4-(β-aminoethyl)-6-methoxy-2-phenyl-, 3010[7], *and derivs.*, 1413[3,5].

$C_{18}H_{18}N_2O_2$ Acetanilide, m,p'-vinylenebis-, 2850[9].
Carbamic acid, (β-5-acridylethyl)-, Et ester, ·*HCl*, 2501[7].
3-Pyrrolealdehyde, 5-ethyl-2,4-dimethyl-, az lactone, 1236[1]

$C_{18}H_{18}N_2O_2S$ Quinoline, 2-dimethylamino-3-p-tolylsulfonyl-, 1626[8].

$C_{18}H_{18}N_2O_3$ Acetamide, α-benzamido-α-benzoyl-N-ethyl-, 1623[8].
Acetanilide, (acetamidophenacyl)-, 2851[1]
2-Pyrazinecarboxylic acid, 2,3,4,5-tetrahydro-4-keto-2,5-diphenyl-, Et ester, 2152[9].

$C_{18}H_{18}N_2O_4$ Antipyrine salicylate, 1030[2]
Butyric acid, α,γ-dibenzamido-, 2982[9]
Malanilide, acetate, 1056[8].
Propionic acid, α,β-dibenzamido-, Me ester, 2983[2]

$C_{18}H_{18}N_2O_4S$ Quinoline, 2-amino-8-methoxy-3-(p-phenetylsulfonyl)-, 402[9]

$C_{18}H_{18}N_2O_5$ Hydratropic acid, β-(N-methyl-α-phenylacetamido)-p-nitro-, 1414[2].

$C_{18}H_{18}N_2O_6$ 3,8-Dipyrrolopyrazinedicarboxylic acid, 4,9-diketo-2,7-dimethyl-, diethyl ester, 3155[5].

$C_{18}H_{18}N_4O_2$ Pyrrole, 2,2',2'',2'''-dihydroxyacetylenetetrakis-, 2683[1].

$C_{18}H_{18}N_4O_6$ Succinic acid, α,β-bis(β-phenylcarbamido)-, 2313[2].

$C_{18}H_{18}N_4O_7$ 3,4-Pyrazoledicarboxylic acid, 1-(α-carbethoxyacetonylazophenyl)-5-methyl-, 598[9].

$C_{18}H_{18}N_4S_2$ m-Phenylenediamine, 4,4'-(m-phenylenedithio)bis-, 3163[3]

$C_{18}H_{18}N_6O_4$ 1,2-Cyclopentanedione, 3-methyl-, bis(p - nitrophenylhydrazone), 2484[8], 2485[1].

$C_{18}H_{18}O$ Ether, bis(γ-phenylallyl), 1985[8]

$C_{18}H_{18}O_2$ 1,6-Hexanedione, 1,6-diphenyl-, 1229[8]

$C_{18}H_{18}O_2S_2$ Acetophenone, o,o' - dithiobis[5-methyl-, 202[8].

$C_{18}H_{18}O_3$ Hydrocinnamic anhydride, 196[2].
Phenol, 2-ethoxy-5-propenyl-, benzoate, 402[1]

$C_{18}H_{18}O_4$ 9,10-Anthradiol, 1,2,3,4-tetrahydro-, diacetate, 1405[3]
α,2'-Bi-p-cresol, diacetate, 401[2]
2-Butanol, 4-(3,4-methylenedioxyphenyl)-, benzoate, 739[8]
Mandelic acid, Me ester, hydrocinnamate, 378[4]
Phenolglutarein, 4-methyl-, 2676[7]
Phenolsuccinein, 3,3-dimethyl-, 2670[8]
Propionic acid, β-p-phenoxybenzoyl-, Et ester, 593[1]

$C_{18}H_{18}O_5$ Benzoic acid, oxybis-, di-Et ester, 392[1]
Phloroglucinol, 2-phenethyl-, diacetate, 1225[8]
2,4-Xylic acid, α[1],α[1']-oxybis-, 184[1]

$C_{18}H_{18}O_6$ Tartaric acid, dibenzyl ester, 47[9]

$C_{18}H_{19}ClO_3$ Chalcone, 4,4'-dimethoxy-, CH_3Cl addn. compd., *HCl, and $HgCl_2$ compd.*, 103[4].

$C_{18}H_{19}CuNO_3$ Benzoin, p'-isopropyl-p-methoxy-, oxime, Cu deriv., 1055[7]

$C_{18}H_{19}Hg_5NO_{11}$ Acetanilide, ar-pentakis(acetoxymercuri)-, 3162[1]

$C_{18}H_{19}IN_2O_4S$ 2-Amino-1-ethyl-3-p-tolylsulfonylquinolinium iodide, 1626[8].

$C_{18}H_{19}N$ Diindanylamine, 755[8]

$C_{18}H_{19}NO_2$ (See also *Apocodeine*.)
Cyclobutanecarboxylic acid, 3-amino-2,4-diphenyl-, Me ester, 1392[1]

$C_{18}H_{19}NO_3$ Phenol, 5-allyl-2-ethoxy-, carbanilate, 402[3]
—, 2-ethoxy-5-propenyl-, carbanilate, 402[4].

$C_{18}H_{19}NO_4$ Codeinone, hydroxy-, 765[8]

$C_{18}H_{19}NO_4S$ 4(1)-Quinolone, 6-ethoxy-2,3-dihydro-1-p-tolylsulfonyl-, 205[9]

$C_{18}H_{19}NO_5$ Propiophenone, α-amino-3,4-dimethoxy-β-(3,4-methylenedioxyphenyl)-, *and HCl*, 1083[8].
—, 3,4-dimethoxy-β-(3,4-methylenedioxyphenyl)-, oxime, 1083[8].

$C_{18}H_{19}N_3OS$ 1,4-Thiopyrone, tetrahydro-2,6-diphenyl-, semicarbazone, 200[1].

$C_{18}H_{19}N_3O_4$ 1-Phthalazineacetic acid, 2-(p-aminophenyl)-1,2,3,4-tetrahydro-4-hydroxy-, acetyl deriv., 1803[1].

$C_{18}H_{19}N_3O_5$ Propionic acid, α-(β-carbamylhydrazino)-β-p-phenoxybenzoyl-, Me ester, 593[6]

$C_{18}H_{19}N_3O_6S$ Compd. from the reaction of H_2SO_4 in the presence of Cu on the diazo sulfate from nitroaminohomoveratrole, m. 142°, 3449[8].

$C_{18}H_{20}Br_2N_4O_3$ Rhamnose, *p*-bromophenylosazone, 2987[2].

$C_{18}H_{20}ClNO_2$ 7 - Benzyloxy - 3,4 - dihydro-6-methoxy-2-methylisoquinolinium chloride, 3011[1].

$C_{18}H_{20}Cl_2N_2$ 9,10-Anthradiamine, 1,5-dichloro-9,10-dihydro *N*, *N*, *N′*, *N′*-tetramethyl-, 754[2].

$C_{18}H_{20}I_2N_4O_3$ Rhamnose, (iodophenyl)osazone, 1794[9], 1795[1].

$C_{18}H_{20}I_2N_4O_4$ Fructose, (iodophenyl)osazone, 1794[9], 1795[1].
 Galactose, (iodophenyl)osazone, 1794[9], 1795[1].
 d-Glucose, (iodophenyl)osazone, 1794[9], 1795[1].

$C_{18}H_{20}MnN_2O_6$ + $5H_2O$, 717[6].

$C_{18}H_{20}N_2$ Isoindoline, 2,2′-ethylenebis-, 2862[6]
 Propiophenone, azine, 899[9], 2309[5]

$C_{18}H_{20}N_2O_2S_2$ Formamidic acid, dithiobis[*N*-phenyl-(?), di-Et ester, 2161[9]

$C_{18}H_{20}N_2O_4$ 3 Pyrroleacrylic acid, α(or β)-benzamido-5-ethyl-2,4-dimethyl-, 1236[1]

$C_{18}H_{20}N_2O_4$ 1,3-Butanediol, dicarbanilate, 2980[6].
 2,4 Pyrroledicarboxylic acid, 3-methyl-5-(phenyliminomethyl)-, di-Et ester, 2160[1]
 p-Toluidine, *N*-[2,3-diethoxy-5(and 6)-nitrobenzal]-, 179[2]

$C_{18}H_{20}N_2O_4S$ 3 Pyrazolone, methyl-2-phenyl-, Me *p*-toluenesulfonate addn compd, 1795[6]

$C_{18}H_{20}N_2O_5S$ Alanine, β-phenyl-*N*-(*N*-tolylsulfonylglycyl)-, 3298[6]

$C_{18}H_{20}N_2O_6Sn$ Ammonium tripyrocatecholatostannate, 3404[2]

$C_{18}H_{20}N_2O_9Sn$ + $3H_2O$ Ammonium tripyrogallostannate, 3404[1]

$C_{18}H_{20}N_4$ Cyclohexanone, 2-hydroxy-, phenylosazone, 2665[1]
 1,2-Cyclopentanedione, 3-methyl-, bisphenylhydrazone, 2484[8]

$C_{18}H_{20}N_4O_4S$ 1,2,3-Benzotriazole, 5-ethoxy-2,3-dihydro-6-methoxy-2-(methoxynitrophenethyl)-1,3-thio-, 1608[2]

$C_{18}H_{20}N_4O_7$ Benzylamine, *N*-(cyclopropylmethyl)-*N*-methyl-, picrate, 390[8]

$C_{18}H_{20}N_4O_8$ Bicarbamic acid, *N*, *N″*-1,4-naphthylenebis-, tetra-Me ester, 410[6]

$C_{18}H_{20}N_4O_{10}$ Alanine, β-methoxy-β-phenyl-, Et ester, picrate, 3456[8]

$C_{18}H_{20}O$ Ether, ethyl β,β-di-*p*-tolylvinyl, 2841.
 3-Pentanone, 2-benzyl-1-phenyl-, 2997[6]

$C_{18}H_{20}O_2$ Benzophenone, *p*-isoamoxy-, 2158[6]
 7-*p*-Cymenecarboxylic acid, benzyl ester, 2488[5]
 Isobutyric acid, β,β′-diphenyl-, Me ester, 2323[2]
 α-Toluic acid, *p*-isopropylbenzyl ester, 2488[2].
 Xanthydrol, 9-isoamyl-, *and perchlorate*, 392[6].

$C_{18}H_{20}O_3$ 3-Butanol, 4-o(and *p*)-anisyl-, benzoate, 739[6, 8].
 Butyric acid, α-hydroxy-β,β-diphenyl-, Et ester, 3000[2].
 Piperitone, 7-piperonylidene-, 3457[4]
 Thebaine deriv., 765[9]

$C_{18}H_{20}O_4$ Acid, m 192°, from rottlerin, 182[8]
 9,10-Anthradiol, hexahydro-, diacetate, 1405[1, 3].

$C_{18}H_{20}O_6$ 1,2-Benzopyran-3-carboxylic acid, 6-hydroxy-2-keto-5,7,8-trimethyl-, Pr ester, acetate, 2320[2]

$C_{18}H_{20}O_6S_2$ 2-Propanone, 1-(phenethylsulfonyl)-3-*p*-tolylsulfonyl-, 1625[8, 9].

$C_{18}H_{21}BrPb$ Plumbane, bromocyclohexyldiphenyl-, 2669[1].

$C_{18}H_{21}Cl_2N$ Diphenethylamine, bis(chloromethyl)-, -*HCl*, 391[9], 392[1].

$C_{18}H_{21}Cl_3IrN_3$ Iridotripicolinotrichloride, 2295[2], 3659[7].

$C_{18}H_{21}KN_2O_2$ Nitrone, α-[β-(*N*-hydroxyanilino)-isobutyl]-α-methyl-*N*-phenyl-(?), K deriv., 2837[3].
 2-Pentanone, 4-(*N*-hydroxyanilino)-4-methyl-, cyclic *N*-phenyloxime(?), K deriv., 2837[5]

$C_{18}H_{21}NO$ Acetamide, *N*,*N*-diethyldiphenyl-, 2997[5].
 Isobutyramide, *N*,*N*-dimethyl-β,β′-diphenyl-, 3451[9].

$C_{18}H_{21}NO_2$ Benzophenone, *p*-isoamoxy-, oxime, 2158[6].
 Cyclohexanol, methyl-, 1-naphthalenecarbamate, 1232[9], 1233[1].
 2,3,4-Hemimellitenol, 6-ethyl-, carbanilate, 2254[8]

$C_{18}H_{21}NO_3$ (See also *Codeine*.)
 Benzoic acid, *p*-dimethylamino-, Et ester, 187[2]
 Butyramide, γ-phenyl-*N*-vanillyl-, 404[8].
 Cyclopentanecarboxylic acid, 1-anilino-, cyclic lactone lactam with 1-hydroxycyclopentanecarboxylic acid, 172[1]
 Morphine, methyl-, 924[2].
 Neopine, 2332[1]

$C_{18}H_{21}NO_4$ Codeinone, dihydrohydroxy-, 765[6]

$C_{18}H_{21}NO_5S$ Glycine, *N*-benzyl-*N*-*p*-tolylsulfonyl-, Et ester, 205[9]

$C_{18}H_{21}NO_6S$ β-Alanine, *N*-*p*-phenetyl-*N*-*p*-tolylsulfonyl-, 205[9]

$C_{18}H_{21}N_3O$ 2-Butanone, 3-benzyl-4-phenyl-, semicarbazone, 3000[2]

$C_{18}H_{21}N_3O_4$ 2,4-Pyrroledicarboxylic acid, 5-formyl-3-methyl-, di-Et ester, phenylhydrazone, 2159[9]

$C_{18}H_{21}N_3O_5$ Propiophenone, 3,4,5-trimethoxy-, *p*-nitrophenylhydrazone, 1610[4]
 3,4-Pyrazoledicarboxylic acid, 1-(*p*-acetamidophenyl)-5-methyl-, di-Et ester, 598[8].

$C_{18}H_{21}N_5O_7$ Pyrrole, 2,3-dimethyl-, picrate, 3455[3].

$C_{18}H_{21}N_5O_7S$ Pseudourea, α-ethyl-β,γ-dimethyl-α-phenylthio-, methopicrate, 374[4]

$C_{18}H_{21}N_9O_{27}$ β-Triamylose, nonanitrate, 380[9].

$C_{18}H_{22}As_2N_4Na_2O_6S_2$ Arsenobenzene, 4,4′-bis[(carbamylmethyl)amino]-3,3′-bis[(hydroxymethyl)amino]-, Na sulfoxylate, 1606[2]

$C_{18}H_{22}ClNO_4$ Oxocodeine, chlorodihydro-, 2165[1]

$C_{18}H_{22}N_2$ Isoquinoline, 2-[o-(β-aminoethyl)benzyl]-1,2,3,4-tetrahydro-, 418[2]

$C_{18}H_{22}N_2O$ Mesitylene, 2,2′-azoxybis-, 2153[7]

$C_{18}H_{22}N_2O_2$ Acetamidine, *N*,*N′*-di-*p*-phenetyl-, 1799[1]
 Holocaine, 1218[1].
 Nitrone, α-[β-(*N*-hydroxyanilino)isobutyl]-α-methyl-*N*-phenyl-(?), *and* -*HCl*, 2837[4, 5].
 2-Pentanone, 4-(*N*-hydroxyanilino)-4-methyl-, cyclic *N*-phenyloxime(?), *and* -*HCl*, 2837[4, 5]

$C_{18}H_{22}N_2O_4$ 4-Isopyrrolecarboxylic acid, 2-[(4-carboxy-3-methyl-2-pyrryl)methylene]-3,5-dimethyl-, diethyl ester, -*HCl*, 3455[4].

$C_{18}H_{22}N_4O_5$ 2-Pyrrolecarboxylic acid, 3-{[(3-carboxy-4-methyl-2-pyrryl)methylene-

amino}carbamyl}-4-methyl-, diethyl ester, 3455[6].

$C_{18}H_{22}N_4O_7$ Benzylamine, α-ethyl-*N*, *N*,α-trimethyl-, picrate, 1053[3].

$C_{18}H_{22}N_4O_8$ Theophylline riboside, triacetyl-, 1812[6].

Theophylline xyloside, triacetyl-, 1812[5].

$C_{18}H_{22}N_4O_8S$ 2-Thiophenecarboxylic acid, α-(dimethylaminomethyl)-*sec*-butyl ester, picrate, 2854[7].

$C_{18}H_{22}O_2$ Biphenetole, dimethyl-, 2832[7].

Piperitone, 7-anisal-, 3457[7].

$C_{18}H_{22}O_2S$ Sulfide, bis(γ-phenoxypropyl), 362[9].

$C_{18}H_{22}O_4$ 9,10-Anthradiol, 1,2,3,4,5,6,7,8-octahydro-, diacetate, 1405[2].

Phthalic acid, monobornyl and monoisobornyl esters, 2998[3].

Terpineol, acid phthalate, 1015[3]; *and Ag salt*, 1398[4].

Thujyl alcohol, acid phthalate, 1015[3].

$C_{18}H_{22}O_5$ 1,2-Benzopyran-3-carboxylic acid, 6,8₁-dihydro-2,6-diketo-5,7,8-trimethyl-, isoamyl ester, 2320[7].

$C_{18}H_{23}Cl_3IrN_3$, 2295[9], 3659[6].

$C_{18}H_{23}CrN_{14}O_{22}$ + 1.5H_2O, 716[9]

$C_{18}H_{23}NO$ Benzohydrylamine, *p*-isoamoxy-, 1400[5], *-HCl*, 2158[6].

$C_{18}H_{23}NO_2$ Lobeline, 1113[8].

$C_{18}H_{23}NO_3$ Codeine, dihydro-, 2161[5], 2502[5].

Δ^3-Cyclohexenecarboxylic acid, 6-(*p*-dimethylaminophenyl)-2-keto-4-methyl-, Et ester, 173[3].

$C_{18}H_{23}NO_4$ 2-*s*-Spirohendecanol, *p*-nitrobenzoate, 1060[8].

$C_{18}H_{23}NO_5$ Codeine, dihydrodihydroxy-, *and perchlorate*, 2332[3].

Dinicotinic acid, 4-furyl-1,4-dihydro-1,2,6-trimethyl-, di-Et ester, 3296[3].

Menthone, 2-(hydroxymethyl)-, *p*-nitrobenzoate, 2846[2].

Ozocodeine, dihydro-, *and salts*, 2165[1,4].

$C_{18}H_{23}N_3O$ Δ^3-*s*-2-Spirohendecenone, 4-phenyl-, semicarbazone, 3447[6].

$C_{18}H_{23}N_4O_3$ Glucosyl-3-amine, phenylosazone, 2662[9].

$C_{18}H_{24}ClNO_4$ 5-Desoxymorphinic acid, chlorodihydro-, Me ester, 2165[4].

$C_{18}H_{24}Cl_3CoN_6$, 2627[4].

$C_{18}H_{24}Cl_6IrN_3$ α-Picolinium iridohexachloride, 3659[6].

$C_{18}H_{24}Cl_6N_2Pt$ Hydroxylamine, β-(α-ethylbenzyl)-, chloroplatinate, 900[1].

$C_{18}H_{24}CoI_3N_6$, 2627[4].

$C_{18}H_{24}CoN_9O_9$, 2627[4].

$C_{18}H_{24}FeN_3O_9$ Hydrogen tri(nitrosopropionylacetone) ferrite, 3403[1].

$C_{18}H_{24}INO$ Compd., m. 181–3°, from *o*-phenoxymethylbenzylamine, 391[9].

$C_{18}H_{24}N_2O$ Quinoline, 7-allyl-8-diethylaminoethoxy-, P 2392[7].

$C_{18}H_{24}N_2O_4$ 3-Pyrrolecarboxylic acid, 2,2′-ethylenebis[4-methyl-, di-Et ester, 2159[6].

$C_{18}H_{24}N_2O_6$ Nipecotic acid, 4-hydroxy-1-isopropyl-, Et ester, *p*-nitrobenzoate, *-HCl*, 3010[5].

—, 4-hydroxy-1-propyl-, Et ester, *p*-nitrobenzoate, *-HCl*, 3010[6].

$C_{18}H_{24}N_4O_6$ Galacturonic acid, phenylhydrazone, phenylhydrazine salt, 1389[4].

$C_{18}H_{24}N_4S_2$ Carbamic acid, diethyldithio-, diphenylguanidine salt, 3098[4].

$C_{18}H_{24}N_6O_{24}$ β-Triamylose, hexanitrate, 380[9].

$C_{18}H_{24}O_2$ Carvomenthol, acid phthalate, 1015[3].

$C_{18}H_{24}O_3$ Ketone, hydroxymethyl 1,2,2,3-tetramethylcyclopentyl, benzoate, 1399[3].

Menthone, 2-(hydroxymethyl)-, benzoate, 2846[3].

Thebaine deriv., and isomer, 765[9].

$C_{18}H_{24}O_4$ Carvomenthol, acid phthalate, *and Ag salt*, 1397[8,9], 1398[1].

Cyclohexaneacetic acid, α-hydroxy-, Me ester, hydrocinnamate, 378[5].

9,10-Phenanthrenediol, 1,2,3,4,5,6,7,8,9,10-decahydro-, diacetate, 1405[2].

$C_{18}H_{25}BrN_2O_2$ Glyoxylic acid, bromo-, menthyl ester, phenylhydrazone, 415[4].

$C_{18}H_{25}NO_4$ Cyclohexanecarboxylic acid, 2-(*p*-dimethylaminophenyl)-4-hydroxy-6-keto-4-methyl-, Et ester, 173[3].

Nipecotic acid, 4-hydroxy-1-isopropyl-, Et ester, benzoate, *-HBr*, 3010[9].

—, 4-hydroxy-1-propyl-, Et ester, benzoate, *-HCl*, 3010[5].

$C_{18}H_{25}NO_5$ 5-Desoxymorphinic acid, dihydro-, Me ester, *and salts*, 2165[3,4].

Mannose, diacetone, anilide, 2663[7].

$C_{18}H_{25}NO_7$ Aniline salt of acid from the oxidation of β-diacetonefructose, 1388[7].

$C_{18}H_{26}$ Naphthalene, decahydro-*m*-xylyl-, 1402[3].

Retene, octahydro-, 1320[8].

$C_{18}H_{26}BeO_4$ Cyclohexanone, acetylmethyl-, Be deriv., 413[8].

$C_{18}H_{26}CoN_{11}O_{16}$ + H_2O and $3H_2O$, 716[4]

$C_{18}H_{26}CrN_{11}O_{16}$ + H_2O and $3H_2O$, 716[8].

$C_{18}H_{26}Fe_4O_{22}$ + $2H_2O$, 2127[8].

$C_{18}H_{26}Hg$ Cyclohexane, γ,γ′-mercuribis[propargyl-, 1054[3].

$C_{18}H_{26}N_2OS$ Urea, α [β-keto-β-(1,2,2,3-tetramethylcyclopentyl)ethyl-β-phenylthio-, 1399[4].

$C_{18}H_{26}N_2O_4$ Nipecotic acid, 4-hydroxy-1-isopropyl, Et ester, *p*-aminobenzoate, *di-HCl*, 3010[5].

—, 4-hydroxy-1-propyl-, Et ester, *p*-aminobenzoate, *di-HCl*, 3010[6].

$C_{18}H_{26}N_2O_6$ Glycine, *N*, *N*′-(2,5-dihydro-2,5-diketo-*p*-phenylene)bis-, di-Bu and di-isobutyl esters, 1055[2].

$C_{18}H_{26}N_4$ 3-Pyrrolealdehyde, 5-ethyl-2,4-dimethyl-, azine, 2236[1].

$C_{18}H_{26}O_2$ Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, α-toluate, 1399[2].

1,6-Hexanedione, 1,3,4,6-tetraphenyl-, 1593[9].

Naphthalene, (dimethoxyphenyl)decahydro-, 1402[3].

$C_{18}H_{26}O_3$ 1,2-Ethanediol, 1-(1,2,2,3-tetramethylcyclopentyl)-, monobenzoate, 1399[8].

$C_{18}H_{26}O_4$ Caproic acid, resorcinol di-ester, 3163[7].

Compd., m. 91°, from lupulone, 415[6].

Resorcinol, dicaproyl-, 3163[7].

$C_{18}H_{26}O_8$ $\Delta^{1,\alpha}$-Cyclopentanemalonic acid, 2,3-(or 2,4)-dicarboxy-(?), tetra-Et ester, 2823[9].

Cyclopentenemalonic acid, 2,3(or 2,4)-dicarboxy-(?), tetra-Et ester, 2823[9].

$C_{18}H_{27}As$ Arsine, dicylcohexylphenyl-, 2839[6].

$C_{18}H_{27}CoN_6O_3$, 2627[5].

$C_{18}H_{27}NO_2$ Undecylenamide, *N*-*p*-hydroxybenzyl-, 404[9].

$C_{18}H_{27}NO_3$ Undecylenamide, *N*-3,4-dihydroxybenzyl-, 404[9].

$C_{18}H_{27}NO_4$ Dinicotinic acid, 1,2-dihydro-4-isobutyl-1,6-dimethyl-2-methylene-, di-Et ester, 3296[1].

$C_{18}H_{27}NO_5$ Compd. from dihydroöxocodeine, -*HCl*, 2165[5].
$C_{18}H_{27}NO_6$ Malonic acid, [(5-carbethoxy-2-ethyl-4-methyl-3-pyrryl)methyl], di-Et ester, 1236[4].
$C_{18}H_{28}$ Hydrocarbon from reduction of isophorone, m. 112°, 1784[5].
$C_{18}H_{28}INO_4$ Dinicotinic acid, 4-isobutyl-2,6-dimethyl-, di-Et ester, methiodide, 3296[2].
$C_{18}H_{28}O_2$ Cumic acid, isooctyl ester, 1793[6].
$C_{18}H_{28}O_3$ Camphor, 3-(hydroxymethyl)-, cyclohexanecarboxylate, 1228[1].
Laurophenone, dihydroxy-, 2320[2], 3163[7].
$C_{18}H_{28}O_{10}$ 1,1,2,3,3-Propanepentacarboxylic acid, penta-Et ester, 3689[9].
$C_{18}H_{29}NO_3S$ Benzoic acid, methylsulfinyl-, menthylamine salt, 3448[8].
$C_{18}H_{29}NO_4$ Dinicotinic acid, 1,4-dihydro-4-isobutyl-1,2,6-trimethyl-, di-Et ester, 3296[1].
$C_{18}H_{29}NO_5$ Acetamide, *N*, *N*-bis(2-hydroxycyclohexyl)-, diacetate, 2831[8].
$C_{18}H_{29}N_3O_7$ Cyclopentanecarboxylic acid, d carboxypropylketo, triethyl ester, semicarbazone, 3446[5].
$C_{18}H_{30}CuO_4$ 2,4-Hexanedione, 3-propyl Cu deriv., 413[3].
2,4-Pentanedione, 3-isobutyl deriv., 413[5].
$C_{18}H_{30}N_2O_2$ Benzoic acid, *p*-amino-, γ-dibutylaminopropyl ester, 1886[1]; γ-di-*sec*-butylaminopropyl and γ-diisobutylaminopropyl esters, -*HCl*, 1852[8].
$C_{18}H_{30}N_4O_4S_2$ 2,5-Piperazinedione, 3,3'-dithiodimethylenebis[6-isobutyl-, 2682[5].
$C_{18}H_{30}N_4O_7$ Butylamine, *N*, *N*, α, α-tetraethyl, picrate, 3280[4]
$C_{18}H_{30}O_2$ See also *Eleostearic acid*
3,3'-Bi[cyclohexane] 1,1'-dione, 3,3',5,5,5',5'-hexamethyl, 1784[5].
Linolenic acid, 706[9].
Resorcinol, dihexyl, 3163[7].
—, dodecyl-, 2320[2], 3163[7].
$C_{18}H_{30}O_{15}$ Triglucosan, 743[3]
Trihexosan, 1598[1]
$C_{18}H_{31}NO_4$ Dinicotinic acid, 1,4,?,? tetrahydro-4-isobutyl-1,2,6-trimethyl-, di-Et ester, 3296[4].
$C_{18}H_{32}Br_2I_2O_2$ Stearic acid, dibromodiiodo-, *and Ca salt*, 1592[1].
$C_{18}H_{32}ClFe_3O_{14}$ + $2H_2O$, 2127[8].
$C_{18}H_{32}O_2$ (See also *Eleostearic acid; Linoleic acid; Stearolic acid.*)
Chaulmoogric acid, 172[2], 2315[2], 3160[6].
λ-Octadecinoic acid, 1591[7].
$C_{18}H_{32}O_4$ Malonic acid, cyclohexylamyl, di ethyl ester, 3160[2].
Palmitic acid, ν,o-diformyl-, *and NH₄ salt*, 172[4].
$C_{18}H_{32}O_6$ Isovalerin, tri-, 2658[5].
$C_{18}H_{32}O_{10}$ Di(trimethylglucosan), 743[5].
$C_{18}H_{32}O_{16}$ Raffinose, 171[1], 306[1], 835[7].
$C_{18}H_{33}As$ Arsine, tricyclohexyl-, 2839[9].
$C_{18}H_{33}Br$ Tridecane, bromocyclopentenyl-, 3160[5].
$C_{18}H_{33}BrO_2$ Chaulmoogric acid, bromodihydro-, 172[8].
$C_{18}H_{33}N_3O$ Civetone, semicarbazone, 1791[6].
$C_{18}H_{34}Br_2O_2$ Stearic acid, λ,μ-dibromo-, 1591[7].
$C_{18}H_{34}Cl_2N_{12}Pt_2$ + xH_2O, 2626[2].
$C_{18}H_{34}I_2O_4$ Stearic acid, dihydroxydiiodo-, *and Ca salt*, 1592[2].
$C_{18}H_{34}O$ Cyclooctadecanone, 1792[4], 2151[6].
$C_{18}H_{34}O_2$ (See also *Elaidic acid; Oleic acid.*)
Chaulmoogric acid, dihydro-, 1598[8].
Cyclohexanelauric acid, 3160[5].
Cyclohexanol, 4,4'-*sec*-butylidenebis-, P 3697[3].
Isoöleic acid, 1591[2].
2,4-Octadecanedione, 738[9].
Octadecenoic acid, 1591[3,4,6].
Stearolactone, 1785[3].
$C_{18}H_{34}O_3$ Chaulmoogric acid, dihydro-μ-hydroxy-, 1598[9].
Cyclohexaneundecylic acid, θ-hydroxy-, Me ester, 1599[2].
Ricinoleic acid, 833[8], 2659[1]; *Na salt*, 444[4]
Stearic acid, θ keto-, 3445[2].
$C_{18}H_{34}O_4$ Chaulmoogric acid, dihydrodihydroxy-, 2315[3,4].
1,16-Hexadecanedicarboxylic acid, 172[3], 1789[3].
Thapsic acid, di-Me ester, 1789[3].
$C_{18}H_{35}IO_3$ Stearic acid, hydroxyiodo-, *and Ca salt*, 1592[2].
$C_{18}H_{35}N$ Chaulmoogrylamine, *and -HCl*, 3160[7].
$C_{18}H_{35}NO$ Chaulmoogramide, dihydro-, 1599[1].
$C_{18}H_{35}NO_3$ Stearic acid, θ-keto-, oxime, 3445[2].
$C_{18}H_{35}N_3O$ Cycloheptadecanone, semicarbazone, 1791[9], 1792[5].
$C_{18}H_{36}Mo_6N_{12}Ni_2O_{26}$ + $16H_2O$, 1185[4]
$C_{18}H_{36}N_2O_4$ Isobutyric acid, *N*, *N'*-decamethylenebis[α-amino-, *and Cu salt*, 371[5].
$C_{18}H_{36}O_2$ (See also *Stearic acid.*)
Palmitic acid, Et ester, 2818[9].
$C_{18}H_{36}O_3$ Stearic acid, hydroxy-, 303[6], 622[7], 1591[2,4].
$C_{18}H_{36}O_4$ Stearic acid, dihydroxy-, 41[8], 3280[7].
$C_{18}H_{38}O_2$ Hexadecane, 1,16-dimethoxy-, 1789[4].
$C_{18}H_{40}N_2O_8$ 2-Octanol, 1-hydroxamino-, oxalate, 1052[3].
$C_{18}H_{49}CoN_6O_8S_2$, 3138[3].
$C_{18}H_{49}CoN_6O_8Se_2$, 3138[7].
$C_{18}H_{50}I_2N_6NiO_2$ + $2H_2O$ Triaminotripropylaminenickelous hydroxyiodide, *KI*, 1589[7].
$C_{18}H_{51}CoN_6O_{12}S_3$, 3138[3,6]
$C_{18}H_{51}CoN_6O_{12}Se_3$, 3138[6]
$C_{18}H_{54}Br_4N_{12}Ni_2$ Tristriaminotriethylaminebisnickelous tetrabromide, 1589[4].
$C_{18}H_{54}I_4N_{12}Ni_2$ Tristriaminotriethylaminebisnickelous tetraiodide, 1589[3].
$C_{18}H_{66}N_6O_6$, 919[1].
$C_{18}H_{72}Cl_4Co_3N_{18}O_4S$ + $5H_2O$, 1961[9].
$C_{19}H_8N_2O_{10}$ Dinitro deriv. from oxidation of atromentin, 406[4].
$C_{19}H_9NO_6$ Naphthalic anhydride, 6-benzoyl-7-nitro-, 1076[4].
$C_{19}H_9NaO_4$ 1,3-Indandione, 2-(1,3-diketo-2-indanylmethylene)-, Na deriv., 911[8]
$C_{19}H_{10}Br_2O_6S$ Sulfonegallein, dibromo-, 2491[1].
$C_{19}H_{10}N_2O_5$ Naphthalimide, 6-benzoyl-7-nitro-, 1076[4].
$C_{19}H_{10}O_3$ Acenaphthenequinone, 3-benzoyl-, 1076[2].
$C_{19}H_{10}O_4$ 1,3-Indandione, 2-(1,3-diketo-2-indanylmethylene)-, 911[8].
Spiro[indan-2,1'-cyclopropane-2',2''-indan]-1,3,1'',3''-tetrone, 185[8].
$C_{19}H_{11}Cl_2NO$ 5(10)-Acridone, chloro(chlorophenyl)-, 1992[3].
$C_{19}H_{11}Cl_3N$ 1,5,10-Trichloro-9-anthrylpyridinium chloride, 755[5].
$C_{19}H_{11}Cl_4NO_2$ Anthranilic acid, *N*, *N*-bis(2,5-dichlorophenyl)-, 1992[4].
$C_{19}H_{11}Cl_4NO_3$ Quinone, 3-chloro-2-(*N*-methylanilino)-5-(2,4,6-trichlorophenoxy)-, 2318[9].

$C_{19}H_{11}I_2NO$ Carbazole, 9-benzoyl-3,6(?)-diiodo-, 1805[2].
$C_{19}H_{11}NO_4$ Naphthalic anhydride, 6-benzoyl-, oxime, 1075[9].
$C_{19}H_{11}N_5O_2$ Imidazophenazine, 2-(*m*-nitrophenyl)-, 1805[6].
$C_{19}H_{12}BrCl_2N$ 1,4-Dichloro-9-anthrylpyridinium bromide, 3166[1]
$C_{19}H_{12}Br_2N_2O$ Carbazole, 1 benzamido-3,6-dibromo-, 1079[7].
$C_{19}H_{12}Br_2O_9S$ Pyrogallolsulfonephthalein, dibromo-, 2491[5].
$C_{19}H_{12}ClNO$ 5(10)-Acridone, 2(and 3) chloro 10-phenyl-, 1992[1,2].
$C_{19}H_{12}Cl_2O_5$ Muconic acid, *α*,*δ* bis(*p*-chlorophenyl)-*β*,*γ*-dihydroxy-, monolactone, Me ester, 2849[6].
$C_{19}H_{12}Cl_3N$ 1-(1,5-Dichloro-9-anthryl)pyridinium chloride, 754[5]
$C_{19}H_{12}Cl_4O_6$ Phthalide, 3,4,5,6-tetrachloro-2-(2,3-cresyl)-2-hydroxy-, diacetate, 1231[8].
$C_{19}H_{12}INO$ Carbazole, 9-benzoyl-3-iodo-, 1805[2].
$C_{19}H_{12}N_2O_5S$ Cinnamonitrile, 3 hydroxy-*α*-(2-naphthylsulfonyl)-4-nitro-, 402[7]
$C_{19}H_{12}N_2O_6$ Naphthalene, 1-(3,4-methylenedioxystyryl) 2,4-dinitro-, 3001[9].
$C_{19}H_{12}N_4$ Imidazophenazine, 2 phenyl, 1805[6]
$C_{19}H_{12}OS$ 5,6-Benzoflavone, 1-thio-, *and HgBr₂ addn compd*, 365[6,7]
$C_{19}H_{12}O_2$ 5,6-Benzoflavone, 2159[1]
$C_{19}H_{12}O_3$ Naphthalic anhydride, 6 benzyl, 1076[1].
$C_{19}H_{12}O_4$ 7 *meso*-Benzanthrenone, 5,6 or 8,9)-dihydroxy, monoacetate, 111[6]
$C_{19}H_{12}O_8S$ Sulfonegallein, *and salts*, 2491[5,6].
$C_{19}H_{13}Cl_2NO_2$ Anthranilic acid. N, N-bis(chlorophenyl)-, 1992[1]
$C_{19}H_{13}Cl_2N_3O_2$ Benzophenone, 4,5-dichloro-2-nitrophenylhydrazone, 750[8].
$C_{19}H_{13}I_2NO_2S$ Carbazole, 3,6-diiodo 9-*p* tolylsulfonyl-, 1805[3]
$C_{19}H_{13}NO_3$ 3,4-Benzacridine-12-carboxylic acid, 10 methoxy-, 598[1]
Ketone, 4-nitro-3 acenaphthenyl phenyl, 1076[2].
Picolinic acid, 4-acenaphthoyl, 764[8].
$C_{19}H_{13}NO_5$ Protoberberine, 2,3,9,10 bismethylenedioxyoxy-, 3297[9]
$C_{19}H_{14}$ Fluorene, 9-phenyl, 3452[2].
$C_{19}H_{14}ClNO$ Benzimidic acid, N-phenyl, o(and *p*)-chlorophenyl ester, 181[8]
10-Hydroxy-9-anthrylpyridinium chloride, 1078[4].
$C_{19}H_{14}ClNO_2$ Anthranilic acid, 4(and 5) chloro-*N*, *N*-diphenyl, 1992[1,2].
Benzamide, o-{m(and *p*)-chlorophenoxy}, 176[1].
$C_{19}H_{14}ClNO_4$ 2,3,9,10-Bismethylenedioxyprotoberberinium chloride, 3298[1].
$C_{19}H_{14}INO_2S$ Carbazole, 3 iodo 9-*p*-tolylsulfonyl-, 1805[3]
$C_{19}H_{14}N_2O_2S$ Quinoline, 2-amino 3-(2-naphthylsulfonyl), 1626[7].
$C_{19}H_{14}N_4O_2$ Benzaldehyde, m(and *p*) {*p*-(*p*-hydroxyphenylazo)phenylazo}, 2836[8].
$C_{19}H_{14}O$ Ketone, 3 acenaphthenyl phenyl, 1075[7].
$C_{19}H_{14}O_2$ Benzaurin, 189[8]
5,6-Benzoflavanone, 2159[1].
Benzophenone, *p*-phenoxy-, 2158[7].
$C_{19}H_{14}O_3$ Resorcinolbenzein, 1988[4].
$C_{19}H_{14}O_4$ 2,7-Naphthalenediol, acetate, benzoate, 911[7].
$C_{19}H_{14}O_5S$ Phenolsulfonephthalein, 1451[5].
$C_{19}H_{14}O_8$ Malonic acid, (*α*-1,3-diketo-2-indanylbenzyl)-, 911[9].
$C_{19}H_{14}O_8S$ Sulfonegallin, *Zn salt*, 2491[6].
$C_{19}H_{14}O_9S$ Pyrogallolsulfonephthalein, 2491[1].
$C_{19}H_{15}$ Triphenylmethyl, 189[5], 1231[6], 1550[7].
$C_{19}H_{15}BO_9$ Xanthone, 1,8-dihydroxy-, boroacetate, acetate, 1052[9].
$C_{19}H_{15}BrO_5$ Chromone, 3-(6-bromopiperonyl)-7-methoxy-2-methyl, 2679[8].
$C_{19}H_{15}BrO_5S_2$ 2-Propanone, 1-(*p*-bromophenylsulfonyl)-3-(2-naphthylsulfonyl)-, 1626[1].
$C_{19}H_{15}Br_5O_8$ Hydroquinol, 2,6-dibromo 3-methoxy-5-(3,4,5-tribromo-2,6-dimethoxy-phenoxy)-, diacetate, 2320[5].
$C_{19}H_{15}Cl_4FeO_6$ 2,3-Dimethoxy 7,8-methylenedioxy-2,3-indeno-3,2-*γ*-benzopyrylium ferrichloride, 2326[5]
$C_{19}H_{15}NO$ 1-Acrylonaphthone, *β*-anilino-, 1590[9].
Benzimidic acid, N-phenyl-, Ph ester, 181[6].
Nitrone, *α*-phenyl-*N*-(*p*-phenylphenyl)-, 2902[7]
--, *N*,*α*,*α* triphenyl-, 421[4].
$C_{19}H_{15}NOS_2$ 4(5) Thiazolone, 2-(benzylmercapto)-5 cinnamal, 600[8].
$C_{19}H_{15}NO_2$ 7-Acenaphthenol, carbanilate, 2852[4], 3010[6]
Benzanilide, *p'*-(*p* hydroxyphenyl)-, 1073[5]
5,6-Benzocinchoninic acid, 3 Δ[1] cyclopentenyl-, 1978[1].
Benzophenone, *p* phenoxy-, oxime, 2158[7]
4 Quinolineacrylic acid, 2 phenyl, Me ester, 1413[4]
$C_{19}H_{15}NO_3$ Benzamide, N (8 hydroxy-1 naphthyl), acetate, 1073[6]
1 Naphthanilide, 3-hydroxy, acetate, 1233[4]
4 Quinolineacrylic acid, 6-methoxy-2 phenyl, *and salts*, 1413[4].
$C_{19}H_{15}NO_4$ Berberrubine, 3294[7]
Protoberberine, 2,3,9,10 bismethylenedioxy dihydro, 3298[1]
$C_{19}H_{15}NO_4S$ 1 Acenaphthenesulfonic acid, 3 benzamido, *Na salt*, 411[4]
$C_{19}H_{15}NO_5$ Ketone, 3,4 dimethoxyphenyl 6,7 methylenedioxy 3 isoquinolyl, *and sulfate*, 1058[9]
$C_{19}H_{15}NO_6$ 1,3(2,4) Isoquinolinedione, 7,8 methylenedioxy 2 piperonylmethyl, 3297[6]
$C_{19}H_{15}N_3$ Acenaphthotriazole, 4,5-dihydro 8 tolyl, 1081[4].
$C_{19}H_{15}N_3O_3$ Phenol, *p* {*p*-(4 keto-1-pyridyl) phenylazo}, acetate, 580[5]
$C_{19}H_{15}N_3S$ 1,4,3-Isothiodiazine, 2 naphthylamino 5 phenyl, *and HBr*, 416[5]
2-3(Thiazolone, 3 (1 naphthyl)-4 phenyl, hydrazone, *and HBr*, 416[5].
$C_{19}H_{15}N_5O_2$ Benzaldehyde, *m* nitro *α*-phenylazo-, phenylhydrazone, 2902[8]
$C_{19}H_{16}$ Acenaphthene, 3-benzyl, 1075[7]
Methane, triphenyl, 180[6], 403[2], 1948[7]
$C_{19}H_{16}AgN_2$ Pseudoindole, 2 methyl 3-(2 methyl 3 indylmethylene), Ag deriv, 414[6].
$C_{19}H_{16}AsNO$ Phenarsazine, 1 benzyloxy-1,6 dihydro-, 1606[9]
$C_{19}H_{16}BrNO_3S_2$ Rhodanine, 5-(5-bromovanillal) 3-(2,5 xylyl), 1086[9]
$C_{19}H_{16}ClN_5O_9$ 1-Imidazoleacetic acid, 5-chloro-2 phenyl-, Et ester, picrate, 1624[1].
$C_{19}H_{16}Cl_3NO_2$ 4 Quinolineëthanol, 6-methoxy-2 phenyl-*α* (trichloromethyl)-, 1413[3].
$C_{19}H_{16}CuN_2$ Pseudoindole, 2-methyl-3-(2-methyl 3-indylmethylene)-, Cu deriv., 414[6].
$C_{19}H_{16}NOSbSe$ Stibine, triphenyl-, hydroxyselenocyanate(?), 3289[6].

-...oloquinazo..., ...,10-tetramethyl-, 2160[8].
Quinoline, 4-(diacetylamino)-2-phenyl-, 3011[1].
Urea, α-acetyl-β-1-naphthyl-α-phenyl-, 2319[5].
$C_{19}H_{16}N_2O_4$ Propionanilide, α-(nitronaphthoxy)-, 1617[8], 1618[1,2].
Pyrazoledicarboxylic acid, diphenyl-, di-Me ester, 2495[8]
Quinazolone, methoxymethyl-2-(3,4-methylenedioxystyryl)-, 207[5]
$C_{19}H_{16}N_2O_5$ Ketone, 3,4-dimethoxyphenyl 6,7-methylenedioxy-3-isoquinolyl, oxime, 1084[1].
$C_{19}H_{16}N_4O$ 1,4-Imidazopyridin-2(3)-one, 3,3-dianilino-, 2858[9]
$C_{19}H_{16}N_4O_2$ 4-Quinolinepropionyl azide, 6-methoxy-2-phenyl-, 1413[5].
$C_{19}H_{16}N_4O_4$ 5-m-Tolylenediamine, 2,4-dinitro-N,N'-diphenyl-, 1222[9]
$C_{19}H_{16}N_4O_5$ m-Phenylenediamine, 5-methoxy-2,4-dinitro-N,N'-diphenyl-, 1609[8].
$C_{19}H_{16}N_4O_6$ Phenol, 3,5-dianilino-4-methoxy-2,6-dinitro-, 1394[6]
$C_{19}H_{16}N_4O_7S$ Aniline, N-methyl-p-phenylmercapto-, picrate, 371[7]
$C_{19}H_{16}N_4O_7$ 1-p-Phenetylpyridinium picrate, 586[3]
$C_{19}H_{16}O$ 3-Acenaphthenecarbinol, α-phenyl-, 1075[8]
Carbinol, triphenyl-, 17[1], 584[7], 1798[8], 3452[1]
2-Propanone, 1-(1-naphthyl)-1-phenyl-, 410[7]
$C_{19}H_{16}OS$ Sulfoxide, diphenylmethyl phenyl, 2669[8].
$C_{19}H_{16}O_2S$ Sulfone, diphenylmethyl phenyl, 2669[8]
$C_{19}H_{16}O_3S$ Thiochromone, 3-α-hydroxybenzyl-n-methyl-, acetate, 263[6]
$C_{19}H_{16}O_5$ 1,9-Anthradiol, 2-methoxy-, diacetate, 411[4].
4-Chromanone, 3-anisal-7-hydroxy-, acetate, 606[1]
$C_{19}H_{16}O_6$ Chromone, 5,7-dihydroxy-3-methoxy-2-(p-methoxystyryl)-, 196[9]
$C_{19}H_{16}O_8S$ Pyrogallolsulfonephthalin, *and Zn salt*, 2491[4].
$C_{19}H_{16}S$ Sulfide, benzohydryl phenyl, 375[2], 2669[8].
$C_{19}H_{17}Br_3$ Anthracene, 2,3,9-tribromo-10-isoamyl-, 3003[8]
$C_{19}H_{17}ClO_5$ Propionic acid (chlorobenzoyl)-hydroxyphenyl-, methyl ester, acetate, 3168[9]
$C_{19}H_{17}Cl_2N$ Anthrone, 1,5-dichloro-10-(1-piperidyl)-, 755[4,9]
$C_{19}H_{17}Cl_2NO$ Anthrone, 4,5-dichloro-10-(1-piperidyl)-, 2492[9]
$C_{19}H_{17}Cl_4FeO_4$ 2,3,6-Trimethoxy-2,3-indeno-3,2-γ-benzopyrylium ferrichloride, 2320[5]
$C_{19}H_{17}Cl_4FeO_5$ 2,3-[7-Methoxychromeno(4,3)]-6,7-dimethoxybenzopyrylium ferrichloride, 2320[5].
$C_{19}H_{17}HgI_3N_2$ Quinoline, complex salt with MeI and HgI_2, 3695[4].
$C_{19}H_{17}N$ 5,6-Benzoquinoline, 1,2,3,4-tetrahydro-3-phenyl-, 2331[9].
-- ...(p-cinnamyl-...)-, *salts*, 2156[9].
Benzyl alcohol, α-methyl-, 1-naphthalenecarbamate, 1232[9].
1-Naphthalenecarbamic acid, xylyl esters, 2319[6].
Neocinchophen, *salts*, P 424[7].
Phenethyl alcohol, 1-naphthalenecarbamate, 1232[9]
Propionanilide, α-1-naphthoxy-, 1617[6,9].
Quinaldine, α-anisal-4-methoxy-, *and -HCl*, 1626[2].
--, 4-methoxy-α-(o-methoxybenzal)-, *and -HCl*, 1626[3].
--, α-veratral-, 1626[4].
4-Quinolinepropionic acid, 2-phenyl-, Me ester, 1413[5].
1(1)-Quinolone, 2-(methoxystyryl)-1-methyl-, 1626[2,3].
Xylenol, 1-naphthalenecarbamate, 1232[9]
$C_{19}H_{17}NO_2S$ p-Toluenesulfonanilide, p-phenyl-, 2818[2]
$C_{19}H_{17}NO_3$ Benzyl alcohol, o-methoxy-, 1-naphthalenecarbamate, 1232[9].
$C_{19}H_{17}NO_4S$ Quinoline, 3-(o-anisylsulfonyl)-2-propenyl-, 419[2]
$C_{19}H_{17}NO_3S_2$ Rhodanine, 5-vanillal-3-(2,5-xylyl)-, 1080[1]
$C_{19}H_{17}NO_4$ 1,2-Benzopyran-3-carboxanilide, 6,8-dihydro-2,6-diketo-5,7,8-trimethyl-, 2320[8]
Isoquinoline, 6,7-methylenedioxy-3-veratryl-, 1084[1]
Protoberberine, 2,3,9,10-bismethylenedioxy-tetrahydro-, *and -HCl*, 3297[9].
$C_{19}H_{17}NO_5$ 3-Isoquinolinecarbinol, α-(3,4-dimethoxyphenyl)-6,7-methylenedioxy-, 1084[1]
Δ^2-5,5-Isoxazolinedicarboxylic acid, 3,4-diphenyl-, di-Me ester, 2327[3]
$C_{19}H_{17}NO_6$ Δ^2-5,5-Isoxazolinedicarboxylic acid, 3,4-diphenyl-, N-oxide, di-Me ester, 2327[2]
$C_{19}H_{17}NO_7$ Homophthal-1-amic acid, 3,4-methylenedioxy-N-piperonylmethyl-, 3297[9].
$C_{19}H_{17}N_3$ 3-Acenaphthenamine, 2-m(o and p)-tolylazo-, 1081[1]
Compds., m. 176° and 238°, from $ClCH_2CO_2H$ and KCN, 2996[1].
Guanidine, α,β,γ-triphenyl-, 1081[5], 1223[3]
α,β-Naphthotriazole, 2-ψ-pseudocumyl-, 1080[8]
$C_{19}H_{17}N_3O_4$ 4-Pyrazolecarboxylic acid, 5-methyl-3-(nitrophenyl)-1-phenyl-, Et ester, 599[7].
$C_{19}H_{17}NaO_3$ Crotonic acid, α-(α-hydroxy-γ-phenylpropoxy)-γ-phenyl-, lactone, Na deriv., 1232[8].
Isocrotonic acid, α-(α-hydroxy-γ-phenylpropoxy)-γ-phenyl-, lactone, Na deriv., 1232[8]
$C_{19}H_{18}BrNO_6$ Malonic acid, bromo(β-nitro-α,β-diphenylethyl)-, di-Me ester, 2327[2].
$C_{19}H_{18}Br_2O_6$ Piperonyl alcohol, 2-bromo-α-(α-bromoethyl)-5,6-dimethoxy-, benzoate, 3450[2].
$C_{19}H_{18}ClNO_5$ Propionic acid (chlorobenzoyl)-hydroxyphenyl-, methyl ester, oxime, acetate, 3168[9].

$C_{19}H_{18}Cl_2O_2$ 1,7-Heptanedione, 1,7-bis(*p*-chlorophenyl)-, 1229^6.

$C_{19}H_{18}INO_4$ Iodide from berberine sulfate, 1086^2.

$C_{19}H_{18}N_2O$ *p*-Cresol, α,α-bis(*p*-aminophenyl)-, 2836^6.

$C_{19}H_{18}N_2O_2$ 6,12-Indoloquinazolinedione, 11,11$_1$-dihydro-2,4,8,10-tetramethyl-, 2160^7.
 4-Pyrazolecarboxylic acid, 5-methyl-1,3-diphenyl-, Et ester, 599^7.

$C_{19}H_{18}N_2O_3$ 2-Indanglyoxylic acid, 1-keto-, Et ester, phenylhydrazone, 1077^9.
 4(3)-Quinazolone, 2-(3,4-dimethoxystyryl)-3-methyl-, 207^3.

$C_{19}H_{18}N_4O_3$ 3(2)-*s*-Tetrazinone, 1,2-diacetyl-1,4-dihydro-4-phenyl-6-*p*-tolyl-, 1084^9.

$C_{19}H_{18}N_4O_4$ 1,4-Piperazinedicarboxanilide, 2,5-diketo-3-methyl-, 915^8.

$C_{19}H_{18}N_4O_7S$ 2-Thiophenemethylamine, *N*-benzyl-*N*-methyl-, picrate, 390^8.

$C_{19}H_{18}N_4S$ Cinnamaldehyde, thiocarbohydrazone, 1811^1.

$C_{19}H_{18}O_2$ Flavone, 3-isopropyl-6-methyl-, 1237^7.
 Flavone, 6-methyl-3-propyl-, 1237^7.

$C_{19}H_{18}O_2S$ Thiochromone, 3-α-ethoxybenzyl 6-methyl-, 203^6.

$C_{19}H_{18}O_3$ 1,2-Benzopyran, 2-(*o*-hydroxystyryl) 2-methoxy-3-methyl-, 3008^3.
 Chromone, 3-benzyl-7-methoxy-2,5-dimethyl-, 197^2.
 Crotonic acid, α-(α-hydroxy-γ-phenylpropoxy)-γ-phenyl-, lactone, 1232^5.
 Ethylene oxide-α-carboxylic acid, β-hydroxy-α,β-diphenethyl-, lactone, 1798^6, 2157^1.
 Isocrotonic acid, α-(α-hydroxy-γ-phenylpropoxy)-γ-phenyl-, lactone, 1232^5.
 Pentadienone, di-anisyl-, 403^6; *and salts*, 180^7.

$C_{19}H_{18}O_4$ 1-Indanone, 5,6-dimethoxy-2-(*m*-methoxybenzal)-, 2326^4.
 Malic anhydride, α-benzyl-β-phenethyl-, 2673^6.
 Mandelic acid, Et ester, cinnamate, 378^7
 β-Truxinic acid, mono-Me ester, 2664^8.

$C_{19}H_{18}O_5$ $\Delta^{1,4}$-Pentadienone, 1,5-bis(hydroxyanisyl)-, 2833^{4,6}.

$C_{19}H_{18}O_6$ 2(1)-Benzofuranone, 3,5-dimethoxy-1-veratral-, 2326^4.
 Flavone, 3,5,7,4′-tetramethoxy-, 1991^1.
 1-Phenanthrenecarboxylic acid, 3,4,6,7-tetramethoxy-, 1406^3.

$C_{19}H_{18}O_7$ 2,3-Chromandione, 4-(3,4-dimethoxyphenyl)-5,7-dimethoxy-, 2489^4.
 Coumarin, 4-(3,4-dimethoxyphenyl)-3-hydroxy-5,7-dimethoxy-, 2489^4.
 Santalin, diacetyl-, 1405^3.

$C_{19}H_{18}Pb$ Plumbane, methyltriphenyl-, 2668^9.

$C_{19}H_{19}Br_5$ Anthracene, 1,2,3,4,9-pentabromo-1,2,3,4-tetrahydro-10-isoamyl-, 3003^8.

$C_{19}H_{19}ClO_3$ 4-*p*-Anisyl-7-methoxy-2,3-dimethylbenzopyrylium chloride, *and $FeCl_3$ compd.*, 3454^9, 3455^1.

$C_{19}H_{19}ClO_5$ 3-(3,4-Dimethoxyphenyl)-5,7-dimethoxybenzopyrylium chloride, 3007^6.
 2-(3,4-Dimethoxyphenyl)-7-hydroxy-3-methoxy-5-methylbenzopyrylium chloride, *and $FeCl_3$ compd.*, 3456^9.

$C_{19}H_{19}Cl_4FeO_3$ 4-*p*-Anisyl-7-methoxy-2,3-dimethylbenzopyrylium chloride, $FeCl_3$ compd., 3455^1.

$C_{19}H_{19}Cl_4FeO_5$ 2-(3,4-Dimethoxyphenyl)dimethoxybenzopyrylium ferrichloride, 3457^{1,2}.
 2-(3,4-Dimethoxyphenyl)-7-hydroxy-3-methoxy-5-methylbenzopyrylium chloride, $FeCl_3$ compd., 3456^9.

$C_{19}H_{19}N$ Quinoline, 4,5,6,8-tetramethyl-2-phenyl-, 418^9.

$C_{19}H_{19}NO$ Lepidine, 2-phenyl-6-propoxy-, 418^8.

$C_{19}H_{19}NO_2$ Quinaldine, α-veratryl-, *and chloroplatinate*, 1626^4.
 Quinoline, 4-methoxy-2-[o(*m* and *p*)-methoxyphenethyl]-, *and -HCl*, 1626^3.
 4(1)-Quinolone, 2-(*p*-methoxyphenethyl)-1-methyl-, *and -HCl*, 1626^3.

$C_{19}H_{19}NO_2S$ Quinoline, 2-propyl-3-*p*-tolylsulfonyl-, 1626^6.

$C_{19}H_{19}NO_3$ 3,5-Morpholinedione, 2-benzyl-6-phenethyl-, 2673^5.
 1,3-Propanediol, 2-(6-methoxy-2-phenyl-4-quinolyl)-, *and salts*, 2680^9, 2681^1.
 Truxillamidic acid, Me ester, 1391^9, 1392^6.

$C_{19}H_{19}NO_4$ Bulbocapnine, 456^{4,6,7}.
 Dibenzoquinolizine-2,3-diol, 5,6,13,13$_1$-tetrahydro-9,10-dimethoxy-, 3295^6.
 Nandinine, 420^4.
 Pseudonandinine, 421^1.

$C_{19}H_{19}NO_5$ Ketone, 3,4-dimethoxyphenyl 1,2,3,4-tetrahydro-6,7-methylenedioxy-3-isoquinolyl, 1083^9.
 Meconin, 2-(*N*-methylbenzamidomethyl)-, 2331^2.

$C_{19}H_{19}NO_6$ Caprophenone, 2,4-dihydroxy-, *p*-nitrobenzoate, 2995^3.
 Malonic acid, (β-nitro-α,β-diphenylethyl)-, di-Me ester, 2327^1.

$C_{19}H_{19}NO_7$ 2,3-Chromandione, 4-(3,4-dimethoxyphenyl)-5,7-dimethoxy-, oxime, 2489^4.

$C_{19}H_{19}N_3O$ Quinazolone, 2-(*p*-dimethylaminostyryl)-1(and 3)-methyl-, 207^{3,4}.

$C_{19}H_{19}N_3O_2$ 4-Quinolinepropionic acid, 6-methoxy-2-phenyl-, hydrazide, 1413^8.

$C_{19}H_{19}N_3O_3$ 2-Pyrrolecarboxylic acid, 3,5-dimethyl-4-(hydroxynaphthylazo)-, Et ester, 1235^9.

$C_{19}H_{19}N_3O_4$ Acrylic acid, β-*p*-phenoxybenzoyl-, Et ester, semicarbazone, 593^5.
 Cyclohexanone, 2-hydroxy-, *p*-nitrophenylhydrazone, benzoate, 2665^5.

$C_{19}H_{20}IN$ α-Benzyl-1-ethylquinaldinium iodide, 419^6.

$C_{19}H_{20}INO_4$ Meconin, 2-(benzalaminomethyl)-, methiodide, 2331^2.

$C_{19}H_{20}IN_5O_7$ Pyrazole, 1-benzyl-3-methyl-, ethiodide, picrate, 3006^4.

$C_{19}H_{20}N_2O_2$ Cinnamic acid, α-acetyl-, Et ester, phenylhydrazone, 2495^5.
 Cyclohexanone, 2-hydroxy-, phenylhydrazone, benzoate, 2665^5.
 Δ^2-4-Pyrazolinecarboxylic acid, 3-methyl-1,5-diphenyl-, Et ester, 2495^5.

$C_{19}H_{20}N_2O_4$ Butyric acid, α,γ-dibenzamido-, Me ester, 2983^1.
 2-Indanglyoxylic acid, 1-keto-, Et ester, $PhNHNH_2$ addn. compd., 1077^8.
 Isovaleric acid, γ,γ′-bis(phenylcarbamyl)-, 49^8.
 Ornithuric acid, 2147^7, 2983^2.
 Propionic acid, α,β-dibenzamido-, Et ester, 2983^2.

$C_{19}H_{20}N_2O_5$ Isoquinoline, 1,2,3,4-tetrahydro-6,7-methylenedioxy-2-nitroso-3-veratryl, 1084^2.
 Ketone, 3,4-dimethoxyphenyl 1,2,3,4-tetrahydro-6,7-methylenedioxy-3-isoquinolyl, oxime, 1083^9.

$C_{19}H_{20}N_4$ α-Tolunitrile, *N*,*N*′-trimethylenebis[α-amino-, 370^9.

$C_{19}H_{20}N_4O_7$ Indole, 3-amyl-, picrate, 598^7.

$C_{19}H_{20}O_2$ 1-*meso*-Benzanthren-7-ol, 2,3,8,9,10,11-hexahydro-, acetate, 1404[5].
1,7-Heptanedione, 1,7-diphenyl-, 1229[6].
Xanthydrol, 9-cyclohexyl-, *and perchlorate*, 392[7].
$C_{19}H_{20}O_4$ Ethylene oxide-α-carboxylic acid, β-hydroxy-α,β-diphenethyl-, 1798[6].
Mandelic acid, Et ester, hydrocinnamate, 378[9].
Phenolglutarein, 4,4-dimethyl-, 2676[7].
Phenolsuccinein, 3-ethyl-3-methyl-, 2676[7].
$C_{19}H_{20}O_5$ Chalcone, 3,4,3′,4′-tetramethoxy-, 2326[4].
Hydrocinnamic acid, α-(α-carboxy γ-phenylpropoxy)-, 2673[6].
$C_{19}H_{20}O_6$ $\Delta^{1,4}$-Pentadienone, 1,5-bis(4-hydroxy-*m*-anisyl)-, hydrate, 2833[5].
$C_{19}H_{20}O_7$ Compd. from diacetylsantalin, m. 183°, 1405[8].
$C_{19}H_{20}O_8$ Acrylophenone, β-furyl-*p*-hydroxy-, glucoside, 593[2].
$C_{19}H_{21}ClO_5$ Chroman, 2-chloro-3-(3,4-dimethoxyphenyl)-5,7-dimethoxy-, 3007[1].
3-(3,4-Dimethoxyphenyl)-3,4-dihydro-5,7-dimethoxybenzopyrylium chloride, 405[6], 3007[3].
$C_{19}H_{21}CuNO_4$, 2466[2].
$C_{19}H_{21}CuN_3O_6S$ + H_2O Butyric acid, β-sulfo-, Cu deriv., pyridine salt, 1979[3].
$C_{19}H_{21}N$ Diindanylamine, *N*-methyl-, 755[9].
$C_{19}H_{21}NO$ Quinoline, 1-benzoyl-1,2,3,4-tetrahydro-2-propyl-, 1626[6].
$C_{19}H_{21}NO_3$ See *Thebaine*.
$C_{19}H_{21}NO_4$ Boldine, 1405[9].
Isoquinoline, 1,2,3,4-tetrahydro-6,7-methylenedioxy-3-veratryl-, *and salts*, 1084[1,2].
$C_{19}H_{21}N_3O_5$ Propionic acid, α-(β-carbamylhydrazino)-β-*p*-phenoxybenzoyl-, Et ester, 593[5].
$C_{19}H_{21}N_5O_8S$ Δ^2-Thiazoline, 5 ethoxy-2-(2,6-xylylamino)-(?), picrate, 415[7].
$C_{19}H_{22}N_2O$ See *Cinchonidine; Cinchonine*.
$C_{19}H_{22}N_2O_2$ Apoquinine, *-HCl*, 1993[9].
Benzamide, *N*, *N*′-2-methyl-1,4-butylenebis-, 2990[2].
Cupreine, 2108[8].
$C_{19}H_{22}N_2O_4$ α-Toluic acid, *N*, *N*′-trimethylenebis[α-amino-, *and salts*, 370[7].
$C_{19}H_{22}N_2O_5S$ Ornithine, *N*δ benzoyl-*N*α-*p*-tolylsulfonyl-, 3690[6].
$C_{19}H_{22}N_2O_6$ "Hanssen's acid," *and -HNO₃*, 398[8].
3-Pyrrolecarboxylic acid, 2,2′-methylenebis-[5-formyl-4-methyl-, di Et ester, 2150[8].
$C_{19}H_{22}N_2O_7$ Amine oxide of "Hanssen's acid," *and -HBr*, 398[8].
$C_{19}H_{22}N_2O_8$ Compd. from "Hanssen's acid," *and salts*, 398[9].
$C_{19}H_{22}N_4O_7$ Cyclohexylamine, 2-benzyl-, picrate, 2665[7].
Quinoline, 1,2,3,4-tetrahydro-2-isobutyl-, picrate, 1082[3].
$C_{19}H_{22}N_9NaO_{14}$ Hexamethylguanidinium picrate, Na picrate, 374[9].
$C_{19}H_{22}N_{10}O_{17}$ Propionic acid, α(or β)-amino-β(or α)-(α,β-diaminopropionylamino)-, Me ester, dipicrate, 2983[4].
$C_{19}H_{22}O_2$ Xanthydrol, 9-hexyl-, *perchlorate*, 392[7].
$C_{19}H_{22}O_3S_2$ Benzophenone, 4,4′-diethoxy-3,3′-dimethylthio-, 2977[1]; *and HgBr₂ and HgCl₂ addn. compds.*, 3651[1,2].
$C_{19}H_{22}O_4$ Chalcone, 4,4′-dimethoxy-, dimethyl acetal, 403[4].
Chroman, 7-methoxy-3-veratryl-, 2326[1].
$C_{19}H_{22}O_5$ Acetophenone, 2,4-dimethoxy-6-veratryloxy-(?), 3007[6].
Chroman, 3-(3,4-dimethoxyphenyl)-5,7-dimethoxy-, 405[5], 3007[4,8].
$C_{19}H_{22}O_6$ Acetophenone, α-(3,4-dimethoxyphenyl)-2,4,6-trimethoxy-, 405[4], 3007[5].
—, 2,4-dimethoxy-6-veratryloxy-, 405[6].
2-Benzofuranol, 1-(3,4-dimethoxyphenyl)-1,2-dihydro-3,5-dimethoxy-2-methyl-, 405[8], 3007[5].
1,2-Benzopyran-3-carboxylic acid, 6-hydroxy-2-keto-5,7,8-trimethyl-, Bu ester, acetate, 2320[7].
Catechol, tetramethyl-, 3006[7].
$C_{19}H_{23}NO_3$ Morphimethine, methyl-, 1795[5,6].
Morphine, ethyl-, 924[2], 1493[9], 1687[7], 1795[5].
Phthalimide, *N*-[β-keto-β-(1,2,2,3-tetramethylcyclopentyl)ethyl]-, 1399[3].
Spiro[cyclopentane-1,2′-1,4-oxazine-5′(6′),1′′-cyclopentane], 3′,4′-dihydro-3′,6′-diketo-4′-*p*-tolyl-, 2831[3].
Valeramide, δ-phenyl-*N*-vanillyl-, 404[8].
$C_{19}H_{23}N_3O$ 3-Pentanone, 2-benzyl-1-phenyl-, semicarbazone, 2997[6].
$C_{19}H_{23}N_3O_3$ Isoquinoline, 1-(2,4-diaminobenzyl)-1,2,3,4-tetrahydro-8-methoxy-2-methyl-6,7-methylenedioxy-, 3457[9].
Niquine, *N*-nitroso-, 1994[1].
$C_{19}H_{23}N_3O_8$ Oxime of compd. from "Hanssen's acid," *-HCl*, 399[1].
$C_{19}H_{23}N_9O_{13}$ Hexamethylguanidinium picrate, *s*-trinitrobenzene addn. compd., 374[9].
$C_{19}H_{23}N_9O_{14}$ Hexamethylguanidinium picrate, picrate, 374[9].
$C_{19}H_{24}Br_2N_2O_2$ Niquine, dibromo, *and -HBr*, 1994[1].
$C_{19}H_{24}ClNO_3$ + $2H_2O$. See *Dionine*.
$C_{19}H_{24}N_2O$ Urea, *s*-bis(α-methylphenethyl)-, 592[7].
$C_{19}H_{24}N_2O_2$ Niquine, 1993[9].
Propene, 1,3-diphenyl, nitrodiethylamine deriv., m. 93°, 1401[3].
Propionamidine, *N*, *N*′-di-*p*-phenetyl-, 1218[6]
$C_{19}H_{24}N_2O_2S$ Benzenesulfonamide, *N*-(1,3-dihydro-2-isoindyl)amyl-, 418[2].
—, *N*-*o*-1-piperidylmethylbenzyl-, 418[2].
$C_{19}H_{24}N_2O_3$ 2-Benzofuranpropionic acid, 1,2,3,4,5,6 hexahydro-1-keto-, Et ester, phenylhydrazone, 1989[4].
$C_{19}H_{24}N_2O_4$ Camphoceanonitrile, 3-(α-hydroxypropyl), *o*-nitrobenzoate, 2999[5].
$C_{19}H_{24}N_2O_5$ Talose, benzylphenylhydrazone, 904[9].
$C_{19}H_{24}N_2S$ Carbanilide, hexamethylthio-, 2314[1].
$C_{19}H_{24}N_4O_4$ Galactose, 6-Me ether, osazone, 1597[3].
β(?)-*d*-[1,5(?)]-Glucose, 4-methyl-, osazone, 170[9].
$C_{19}H_{24}N_4O_6$ 3-Pyrrolecarboxylic acid, 2,2′-methylenebis[5-formyl-4-methyl-, di-Et ester, dioxime, 2159[8].
$C_{19}H_{24}N_6O_{11}S$ *p*-Toluenesulfono-*p*-phenetide, 3,2′,3′,6′ tetranitro-, Et_2NH addn. compd., 400[3].
$C_{19}H_{24}O_3$ Camphor, 3-(hydroxymethyl), α-toluate, 1228[1].
Δ^2-1-Propenone, 3-hydroxy-1-(1,2,2,3-tetramethylcyclopentyl)-, benzoate, 1399[8].
$C_{19}H_{24}O_4$ 9,10-Anthradiol, 1,2,3,4,5,6,7,8-octahydro-2-methyl-, diacetate, 1405[4].
Propiophenone, β-*p*-anisyl-*p*-methoxy-, dimethyl acetal, 403[3].

$C_{19}H_{24}O_5$ Taxinol, 767[5].
$C_{19}H_{24}O_{11}S$ Glucose, 2,5,6-triacetyl-3-toluenesulfonyl-, 2663[2].
$C_{19}H_{24}Pb$ Plumbane, cyclohexylmethyldiphenyl-, 2669[1].
$C_{19}H_{25}NO$ Camphidone, 3-benzyl-4-ethylidene-, 2999[4].
Triethylamine, *β*-(1-allyl-2-naphthoxy)-, P 2392[7].
$C_{19}H_{25}NO_2$ 2-Octanol, 1-naphthalenecarbamate, 1233[1].
$C_{19}H_{25}NO_3$ Morphine, ethyldihydro-, 2165[1].
$C_{19}H_{25}NO_4$ Phthalamic acid, *N*-[*β*-keto *β*-(1,2,2,3 - tetramethylcyclopentyl)ethyl]-, 1399[3].
$C_{19}H_{25}NO_5$ Ozomorphine, ethyldihydro-, *and* -*HI*, 2165[1,5].
$C_{19}H_{25}NO_6$ Glucosyl-3-amine, diacetone-, Bz deriv., 2662[9].
$C_{19}H_{25}N_5O_9S$ *p* - Toluenesulfono - *p* - phenetide, 3,2′,3′-trinitro-, Et_2NH addn. compd., 400[7]
$C_{19}H_{26}$ Methane, cyclohexylcyclohexylidenephenyl-, 2328[5]
$C_{19}H_{26}INO_5$ Ozocodeine, dihydro-, methiodide, 2165[4].
$C_{19}H_{26}N_2O_3$ Julocrotine, 2332[3]
$C_{19}H_{26}N_2O_6$ 1,1,2-Butanetricarboxylic acid, 3 keto-, tri-Et ester, phenylhydrazone, 3690[2].
Nipecotic acid, 1-butyl-4-hydroxy-, Et ester, *p*-nitrobenzoate, -*HCl*, 3010[5]
—, 4-hydroxy-1-isobutyl-, Et ester, *p* nitrobenzoate, -*HCl*, 3010[6]
$C_{19}H_{26}N_4O_9$ 1,1′-Spirobipiperidine-4 carboxylic acid, *N*-hydroxy-, picrate, Et ester, 385[6]
$C_{19}H_{26}O_2$ Cyclopentanecarbinol, 1,2,2,3 tetramethyl-, cinnamate, 1399[2].
$C_{19}H_{26}O_3$ Benzoic acid, *o* acetyl-, menthyl ester, 1800[2].
Ketone, hydroxymethyl 1,2,2,3-tetramethylcyclopentyl, *α*-toluate, 1399[8]
$C_{19}H_{26}O_8S$ Fructose, *α*-diacetone-3-toluenesulfonyl-, 2663[2]
$C_{19}H_{26}O_{10}$ 3,4,4,5-Heptanetetracarboxylic acid, 2,6-diketo-, tetra-Et ester, 3690[1]
1,1,2,3-Pentanetetracarboxylic acid, 2 acetyl-4-keto-, tetra-Et ester, 3690[1]
$C_{19}H_{27}$ Methyl, tris(*tert*-butylethinyl)-, 190[3]
$C_{19}H_{27}BrN_2O_2$ Glyoxylic acid, bromo-, menthyl ester, *p* tolylhydrazone, 415[4].
$C_{19}H_{27}Cl$ Methane, (1-chlorocyclohexyl)cyclohexylphenyl-, 2328[6].
Methane, chlorodicyclohexylphenyl-, 190[1]
Methane, tris(*tert*-butylethinyl)chloro-, 190[2]
$C_{19}H_{27}NO$ Δ[2]-1-Propenone, 1-(1,2,2,3-tetramethylcyclopentyl)-3-(*p*-toluino)-, 1399[8].
$C_{19}H_{27}NO_2S$ 1-Propanone, 3-hydroxy 1-(1,2,2,3 tetramethylcyclopentyl)-, thionocarbanilate, 1399[8]
$C_{19}H_{27}NO_4$ Nipecotic acid, 1-butyl-4-hydroxy-, Et ester, benzoate, *salts*, 3010[2].
—, 1-*sec*-butyl-4-hydroxy-, Et ester, benzoate, -*HBr*, 3010[9].
—, 4-hydroxy-1-isobutyl-, Et ester, benzoate, -*HCl*, 3010[3].
$C_{19}H_{27}NO_5$ 5-Desoxymorphinic acid, dihydro-, Et ester, 2165[7].
$C_{19}H_{27}NO_6S$ Alanine, phenyl-, camphorsulfonate, 2324[9], 2325[1].
$C_{19}H_{28}BrNO_2$ 1,1′-Spirobi[piperidine]-4-carboxylic acid, *N*-bromo-4′-phenyl-, ethyl ester, 690[1].
$C_{19}H_{28}INO_5$ 5-Desoxymorphinic acid, dihydro-, Me ester, methiodide, 2165[6].
$C_{19}H_{28}N_2OS$ Urea, *α*-[*β*-keto-*β*-(1,2,2,3-tetramethylcyclopentyl)ethyl]methyl-*β*-phenylthio-, 1399[4].
$C_{19}H_{28}N_2O_4$ Nipecotic acid, 1-butyl-4-hydroxy-, Et ester, *p*-aminobenzoate, *di HCl*, 3010[5]
—, 4-hydroxy-1-isobutyl-, Et ester, *p* aminobenzoate, *di-HCl*, 3010[6].
$C_{19}H_{28}N_4O_4$ Piperidine, 1,1′-[2-(2,4-dinitrophenyl)trimethylene]bis-, *and di-HCl*, 1414[7].
$C_{19}H_{28}O_2$ Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, hydrocinnamate, 1399[2].
$C_{19}H_{28}O_{11}$ Cellobioside, *β* benzyl-, 380[6].
$C_{19}H_{29}NO_2$ Triethylamine, *β*-(4,6-diallyl *o*-anisyloxy)-, P 2392[7]
$C_{19}H_{29}NO_3$ Undecylenamide, *N*-vanillyl-, 404[8].
$C_{19}H_{29}NO_{11}$ Glucoside, *O* tetraacetylsarcosine-, Et ester, 2660[1].
$C_{19}H_{30}$ Colophene, 299[5].
$C_{19}H_{30}AsI$ Dicyclohexylmethylphenylarsonium iodide, 2839[6]
$C_{19}H_{30}O_2$ 7-*p*-Cymenecarboxylic acid, isooctyl ester, 2188[5]
$C_{19}H_{30}O_3$ Tridecophenone, 2,4-dihydroxy-, 2320[7]
$C_{19}H_{30}O_9$ 1,2,4-Pentanetricarboxylic acid, 2 carboxymethyl-3 keto-4-methyl-, tetra Et ester, 2490[4]
$C_{19}H_{32}$ Fluorene, 9-cyclohexyldodecahydro-, 3452[7]
$C_{19}H_{32}O_2$ Acid from copal resin acid, 2756[7]
Resorcinol, 4 tridecyl-, 2320[8].
$C_{19}H_{33}N$ Homochaulmoogronitrile, 3160[8].
$C_{19}H_{34}$ Methane, tricyclohexyl-, 3452[1]
$C_{19}H_{34}O_4$ Malonic acid, cyclohexylhexyl-, diethyl ester, 3160[7]
$C_{19}H_{36}AsI$ Tricyclohexylmethylarsonium iodide, 2839[6]
$C_{19}H_{36}Cl_2O_2$ Palmitic acid, 1,3-dichloropropyl ester, 2818[6]
$C_{19}H_{36}N_2O_4$ Palmitic acid, *ν*,*o*-diformyl-, Me ester, dioxime, 172[4].
$C_{19}H_{36}N_4$ Caprylonitrile, *N*,*N*′ trimethylenebis[*α* amino-, *di HCl*, 370[8].
$C_{19}H_{36}O_2$ Chaulmoogric acid, dihydro-, Me ester, 172[2]
Cyclohexanetridecoic acid, 1599[3], 3160[8].
2,4-Nonadecanedione, 739[1]
Oleic acid, Me ester, 1590[1]
$C_{19}H_{36}O_3$ Chaulmoogric acid, dihydro *μ* hydroxy-, Me ester, 1598[8].
Cyclohexadnebauric acid, hydroxy-, methyl ester, 3160[8]
Cyclohexanetridecoic acid, *μ* - hydroxy-, 1599[2]
Nonadecoic, *ι* keto-, 3445[8]
$C_{19}H_{36}O_4$ Chaulmoogric acid, dihydrodihydroxy-, Me ester, 2315[3,4].
1,17 - Heptadecanedicarboxylic acid, 1789[8].
1,15 - Pentadecanedicarboxylic acid, di-Me ester, 1789[8], 1791[9].
1,15 Pentadecanediol, diacetate, 1789[8].
1,13 - Tridecanedicarboxylic acid, di-Et ester, 1789[8].
$C_{19}H_{36}O_{11}$ Maltoside, heptamethylmethyl-, 2315[1].
$C_{19}H_{37}NO$ Myristic acid, piperidide, 2845[1].
$C_{19}H_{38}N_2O_4$ Caprylic acid, *N*, *N*′ - trimethylenebis[*α* - amino-, *and salts*, 370[8].
$C_{19}H_{38}O_2$ Margaric acid, ethyl ester, 1275[4].
Palmitic acid, Pr ester, 2310[6], 2818[9].

$C_{19}H_{42}IN$ Tributylheptylammonium iodide, 3688[6].
$C_{20}Cl_4H_{10}O_4$ Phenolphthalein, tetrachloro-, 938[7].
$C_{20}H_6Br_2Cl_4O_4$ Fluoran, 2,4 - dibromo - 12,13,-14,15 - tetrachloro - 3 - hydroxy-, 3001[6]
$C_{20}H_6Cl_4Na_2O_5$ Fluoran, 12,13,14,15 - tetrachloro - 3,4 - dihydroxy-, di - Na deriv , 3001[7].
$C_{20}H_7BrCl_4O_5$ Fluoran, 2 - bromo - 12,13,14,15 - tetrachloro-3,4-dihydroxy-, 3001[7].
$C_{20}H_7Br_4IO_5$ Eosin, iodo-, 2563[3].
$C_{20}H_7Cl_4NaO_4$ Fluoran, 12,13,14,15 - tetrachloro - 3 - hydroxy -, Na deriv , 3001[6].
$C_{20}H_7Cl_4NaO_5$ Fluoran, 12,13,14,15 - tetrachloro - 3,4 - dihydroxy-, mono-Na deriv , 3001[7].
$C_{20}H_8Br_4O_5$ See *Eosin.*
$C_{20}H_8Cl_2O_4S$ 1,2 - Naphthoquinone, 3,3′ - thiobis[4 - chloro-, *and $SnCl_4$ addn. compd* , 3002[7] [7].
$C_{20}H_8Cl_4O_4$ Fluoran, 12,13,14,15 - tetrachloro-3-hydroxy-, 3001[5].
$C_{20}H_8Cl_4O_5$ Fluoran, 12,13,14,15 - tetrachloro-3,4 - dihydroxy-, 3001[7].
$C_{20}H_9N_5O_6$ $\alpha\gamma$ - Dibenzophenazine, 2,4,7 - trinitro-, 1620[4].
$C_{20}H_{10}BrN_3O_2$ $\alpha\gamma$ - Dibenzophenazine, 10 (or 13) - bromo - 12 (or 11) - nitro-, 2666[8]
$C_{20}H_{10}Br_2HgO_6$ See *Mercurochrome*
$C_{20}H_{10}Br_4O_4$ Phenolphthalein, tetrabromo , 1115[8]
$C_{20}H_{10}Br_4O_5$ 1,1,2 - Ethanetriol, 1,2 bis(2,4 dihydroxyphenyl) 2 - phenyl , anhydride, tetra-Br deriv , 2324[6]
$C_{20}H_{10}Cl_4O_4$ Isophenolphthalein, tetrachloro , 596[8]
Phenolphthalein, tetrachloro , 1115[5].
9 - Xanthene o - benzoic acid, 3′,4′,5′,6′-tetrachloro - 3 - hydroxy , 3001[6].
$C_{20}H_{10}I_4O_4$ Phenolphthalein, tetraiodo-, 432[6], 1115[4], 2369[3]
$C_{20}H_{10}N_2O_5$ β - Dinaphthofuran, dinitro-, 2851[3].
$C_{20}H_{10}N_4O$ o - Benzoylene - 2,3 - phenazinoiminazole, 1805[4]
$C_{20}H_{10}N_6O_8$ Quinoxaline, 2,3 bis(3,5 dinitrophenyl)-, 1620[6]
$C_{20}H_{10}NiO_6 + 1.5H_2O$ Complex Ni salt of juglone, 2325[4].
$C_{20}H_{10}O_2$ See *Perylenequinone*
$C_{20}H_{11}BrCl_2$ Anthracene, 9 bromo 1,5 - dichloro - 10 - phenyl , 2678[1]
$C_{20}H_{11}BrCl_2O$ Anthrone, 10 - bromo 1,5 - dichloro - 10 - phenyl , 2678[1].
$C_{20}H_{11}BrOS_2$ Spiro[1,3 - benzodisulfole - 2,9′-(10′) - phenanthrene] - 10′ - one, 5(or 6) bromo-, 1707[9].
$C_{20}H_{11}Cl_2NO_3$ Anthrone, 1,5 - dichloro - 10-nitro-10-phenyl-, 2677[9]
$C_{20}H_{11}Cl_2NO_4$ Anthrone, 1,5 - dichloro - 10 hydroxy - 10 - (nitrophenyl) , 2678[1]
$C_{20}H_{11}Cl_3$ Anthracene, 1,5,9 - trichloro - 10 phenyl , 2678[3].
$C_{20}H_{11}Cl_3O$ Anthrone, 1,5,10 trichloro - 10 phenyl-, 2677[9].
$C_{20}H_{11}Cl_4NO_4$ Fluoran, 12,13,14,15 - tetrachloro - 3 - hydroxy , NH_4 deriv., 3001[6].
$C_{20}H_{11}Cl_4NS_2$ α - Tolunitrile, α,α - bis(2,5 - dichlorophenylmercapto)-, 3289[4].
$C_{20}H_{12}$ Perylene, 1076[4], 1077[1], P 1813[3], P 2333[5], P 3170[8], P 3461[1].
$C_{20}H_{12}BrN_3O_7$ Benzanilide, 2′ bromo - N hydroxy - 4′,6′ - dinitro , benzoate, 2606[7].
$C_{20}H_{12}Cl_2$ Anthracene, 1,5 - dichloro - 9 - phenyl-, 2677[8].
$C_{20}H_{12}Cl_2N_2O_2$ Aniline, (1,5 - dichloro - 9 - anthryl)-3-nitro-, 754[5].
$C_{20}H_{12}Cl_2O$ Anthrone, 1,5 - dichloro - 10 - phenyl-, 2677[9].
$C_{20}H_{12}Cl_2O_2$ Anthrone, 1,5 - dichloro - 10 - hydroxy - 10 - phenyl-, 2678[1]
$C_{20}H_{12}Cl_4$ Anthracene, 1,5,9,10 - tetrachloro-9,10 - dihydro - 9 - phenyl-, 2678[2]
$C_{20}H_{12}N_2S_2$ Benzothiazole, 1,1′ - p - phenylenebis , 600[3].
$C_{20}H_{12}N_4O_4$ Naphthalene, 2,2′ - azobis[4 - nitro-, 750[9].
$C_{20}H_{12}N_4O_6$ Acetonitrile, tris(p - nitrophenyl)-, 585[7].
$C_{20}H_{12}O$ β - Dinaphthofuran, 2851[3].
$C_{20}H_{12}OS$ Dibenzophenothioxin, 1233[3], 2326[6].
$C_{20}H_{12}O_2$ 3,9 - Perylenediol, 1077[3]
$C_{20}H_{12}O_5$ See *Fluorescein.*
$C_{20}H_{13}AsClN$ Dibenzophenarsazine, chlorodihydro-, 1606[7]
$C_{20}H_{13}Br$ Anthracene, 9 - bromo - 10 - phenyl-, 3153[1]
$C_{20}H_{13}BrO_2S_2$ o - Phenylenedimercaptan, 4 bromo-, dibenzoate, 1797[8].
$C_{20}H_{13}ClO$ Xanthene, 9 - p - chlorobenzal-, 392[9]
$C_{20}H_{13}ClO_2S$ Naphthol, 4 chloro - 1,2′ - thiobis-, 1234[3]
$C_{20}H_{13}Cl_2N$ Aniline, 1,5 dichloro - 9 - anthryl-, 754[5]
9 - Anthramine, 4,5 dichloro - N - phenyl , 2192[8]
$C_{20}H_{13}NO_3$ 1,10 - Anthracenedione, 9 anilino - 4-hydroxy-, 2853[7]
2 - Xanthenecarboxamide, 9 keto-, 392[8].
$C_{20}H_{13}N_3O$ Dibenzophenazinol, amino-, *di-HCl*, 603[3].
$C_{20}H_{13}N_3O_7$ Picrate, m. 139°, of hydrocarbon from cholesterol, 1241[9]
$C_{20}H_{14}$ Anthracene, 9 phenyl , 2455[6].
$C_{20}H_{14}Cl_2O_2$ 9,10 - Anthradiol, 1,5 - dichloro-9,10 - dihydro - 9 - phenyl-, 2678[2].
$C_{20}H_{14}Cl_2O_5$ Muconic acid, α,δ - bis(p - chlorophenyl) - β,γ - dihydroxy-, monolactone, Et ester, 2849[6]
— , α,δ - bis(p - chlorophenyl) - β - hydroxy-γ - methoxy , lactone, Me ester, 2849[6].
$C_{20}H_{14}Cl_6O_4$ Diisosafrole, hexachloro , 718[3]
$C_{20}H_{14}CoO_6S_2$, 2924[3]
$C_{20}H_{14}Hg$ Mercury di-1-naphthyl, 176[7] [8], 177[3]
$C_{20}H_{14}N_2OS_2$ Rhodanine, 5 - (1 - naphthylaminomethylene) 3 - phenyl-, 600[5]
$C_{20}H_{14}N_2O_2S$ 4 - Thiazolidone, 5 - fural - 3 - phenyl-2-phenylimino-, 1980[7]
$C_{20}H_{14}N_2O_3$ 3,4 - Benzacridine - 12 carboxylic acid, 10-acetamido , 598[1]
$C_{20}H_{14}N_2O_5$ Rhodamine, isonitroso , 1770[7].
$C_{20}H_{14}N_4$ Dibenzophenazine, diamino-, 603[2].
$C_{20}H_{14}N_4O$ Imidazophenazine, 2-p-anisyl-, 1805[6]
1(2) - Quinolinenitrile, 2,2′ - oxybis - (?), 2680[3].
$C_{20}H_{14}N_4O_2$ Hydrazine, s - dicinchoninyl-, 2672[6].
$C_{20}H_{14}N_4O_7$ 6,7 - Benzoquinoline, 2 - methyl-, picrate, 1628[1].
$C_{20}H_{14}OS$ 2 Naphthol, 1-(2-naphthylmercapto)-, 3280[7]
2(1) - Thionaphthenone, 1,1 - diphenyl-, 375[2].
$C_{20}H_{14}O_2$ 1,2 - α - Naphthopyrone, 4 - methyl-3-phenyl-, 595[7].

9-Phenanthrol, 10-phenoxy-, 412[8].
Phthalide, diphenyl-, 751[1], 2490[9].
$C_{20}H_{14}O_2S_2$ 3,3′-Bithiochromone, 6,6′-dimethyl-, 203[4].
o-Phenylenedimercaptan, dibenzoate, 1797[7].
$C_{20}H_{14}O_3$ Benzophenone, p-hydroxy-, benzoate, 2158[7].
$C_{20}H_{14}O_4$ (See also *Isophenolphthalein; Phenolphthalein.*)
7-*meso*-Benzanthrenone, hydroxymethoxy-, acetate, 411[6,7].
1,1′-Bi[naphthalene]-3,4,3′,4′-tetrol, 383[4].
Muconic acid, β,γ-dihydroxy-α,δ-di-p-tolyl-, dilactone, 2849[8].
$C_{20}H_{14}O_4S_2$ 3,3′-Bithiochromone, 6,6′-dimethoxy-, 203[5].
$C_{20}H_{14}O_5$ 1,1,2-Ethanetriol, 1,2-bis(2,4-dihydroxyphenyl)-2-phenyl-, anhydride, 2324[3].
$C_{20}H_{14}O_6$ Acetophenone, α-2-furyl-α-hydroxy-3,4-methylenedioxy-, benzoate, 1615[9].
Ketone, 2-furyl-α-hydroxypiperonyl, benzoate, 1615[9].
$C_{20}H_{14}O_7$ Atromentin, 406[1].
$C_{20}H_{15}BrO_7$ Compd., m. 192–3°, from the diacetate of 1-bromo-1-(α-bromo-o-methoxybenzyl)-3,5-dihydroxy-2(1)-benzofuranone, 195[5].
$C_{20}H_{15}Br_2N$ 10-Bromo-9-anthrylmethylpyridinium bromide, 3003[7].
$C_{20}H_{15}Br_2N_3O_2$ Benzoic acid, p-nitrobenzalhydrazide, 2,4-dibromophenylhydrazone, 1085[3].
$C_{20}H_{15}ClO$ o-Toluyl chloride, α,α-diphenyl-, 591[6].
$C_{20}H_{15}ClOS$ Acetyl chloride, diphenylphenylmercapto-, 375[2].
$C_{20}H_{15}ClO_5$ Xanthydrol, 9-p-chlorobenzyl-, *perchlorate*, 392[5].
$C_{20}H_{15}CuNO_2$ Benzoin, α-phenyl-, oxime, Cu deriv., 1055[7].
$C_{20}H_{15}IN_2$ Dye, m. above 330°, from 2,2′-methylenebisquinoline and CH_2I_2, 2330[3].
$C_{20}H_{15}N$ Acetonitrile, triphenyl-, 134[4], 584[8].
Benzoquinoline, methylphenyl-, *and salts*, 418[8].
Di-2-naphthylamine, 134[4].
$C_{20}H_{15}NO$ Benzoquinolinol, methylphenyl-, 419[1].
Isocyanic acid, α,α-diphenyl-p-tolyl ester, 591[6].
$C_{20}H_{15}NO_2$ Dibenzamide, N-phenyl-, 745[4].
$C_{20}H_{15}NO_3$ Picolinic acid, 4-acenaphthoyl, Me ester, 764[2].
$C_{20}H_{15}N_3O$ 2(1)-Quinoxalone, 3-(α-4-pyridylbenzyl)-, 188[1].
$C_{20}H_{15}N_3O_4$ 4,5-α,β-Naphthotriazolediol, 2-phenyl-, diacetate, 2859[6].
Salicylaldehyde, p-nitrobenzoate, phenylhydrazone, 399[5].
—, o-nitrophenylhydrazone, benzoate, 745[9].
$C_{20}H_{15}N_5$ 2,3-α-Quinoxalophenazine, 6-aminodimethyl-, 2842[6].
$C_{20}H_{15}N_5O$ Benzoyl-C-iminodiphenyltetrazolium betaine, *and salts*, 1224[4].
$C_{20}H_{15}N_5O_7$ Indazole, 3-p-tolyl-, picrate, 2496[6].
$C_{20}H_{15}N_5O_8$ Indazole, 3-p-anisyl-, picrate, 2496[7].
$C_{20}H_{16}BNO_8$ Phenanthrenequinone, 4-acetamido-1-hydroxy-, boroacetate, 1052[9].
$C_{20}H_{16}Br_2N_4$ Benzoic acid, benzalhydrazide, 2,4-dibromophenylhydrazone, 1085[3].
$C_{20}H_{16}Br_2O_2S_2$ 3,3′-Bi[thiochroman]-4,4′-dione, 3,3′-dibromo-6,6′-dimethyl-, 203[4].
$C_{20}H_{16}Br_2O_7$ 2(1)-Benzofuranone, 1-bromo-1-(α-bromo-o-methoxybenzyl)-3,5-dihydroxy-, diacetate, 195[4].
$C_{20}H_{16}N_2$ 2,2′-Biquinoline, dimethyl-, *and -HCl*, 205[4].
$C_{20}H_{16}N_2O_2$ Cinnamaldehyde, oxime, 1-naphthalenecarbamate, 179[6].
Ketiponitrile, α,δ-di-p-tolyl-, 2849[4].
$C_{20}H_{16}N_2O_6S_2$ Maleanilic acid, o,o′-dithiobis-, 600[2].
$C_{20}H_{16}N_4O_2$ Condensation product, m. 165–6°, from 1,5-diphenyl-1,2,3-triazole-4-aldehyde and Et cyanoacetate, 416[9].
$C_{20}H_{16}N_4O_3$ Benzophenone, 4-(m-nitrophenyl)semicarbazone, 175[6].
$C_{20}H_{16}N_4O_4$ Anthranilic acid, N-benzoyl-, β-(m-nitrophenyl)hydrazide, 206[9].
$C_{20}H_{16}N_4O_6$ 1,2,3,6-Dioxdiazine, 4,5-dibenzoyl-, dioxime, di-Ac deriv., 746[2].
$C_{20}H_{16}N_6O_3$ 1,2,3-Triazole-4-carboxylic anhydride, 5-methyl-1-phenyl-, 416[9].
$C_{20}H_{16}O$ Acetaldehyde, triphenyl-, 1988[6].
Acetophenone, α,α diphenyl-, 2999[9].
Benzophenone, p-(p-tolyl)-, 1988[3].
$C_{20}H_{16}O_2$ Acetic acid, triphenyl-, *Ag salt*, 409[2].
Acrylonaphthone, methoxy-β-phenyl-, 1616[8,9].
Benzoin, α-phenyl-, 47[1].
Δ²-Cyclopentenone, 4,5-dibenzal-2-hydroxy-3-methyl-, 2484[3].
Toluic acid, α,α-diphenyl-, *and hydroxyammonium salt*, 591[6,7].
$C_{20}H_{16}O_2S$ Acetic acid, diphenylphenylmercapto-, *and salts*, 375[1].
$C_{20}H_{16}O_2S_2$ $\Delta^{3,3'}$-Bi[thiochroman]-4,4′-dione, 6,6′-dimethyl-, 203[3].
$C_{20}H_{16}O_4S_2$ $\Delta^{3,3'}$-Bi[thiochroman]-4,4′-dione, 6,6′-dimethoxy-, 203[4].
$C_{20}H_{16}O_6$ Coumarin, 7,8-dihydroxy-4-methyl-3-phenyl-, diacetate, 595[7].
Isoflavone, dihydroxymethyl-, diacetate, 196[7], 197[2].
$C_{20}H_{16}O_7$ 2(1)-Benzofuranone, 3,5-dihydroxy-1-o-methoxybenzal-, diacetate, 195[4].
$C_{20}H_{16}O_8S$ Pyrogallolsulfonephthalein, mono-Me ether, 2491[4].
$C_{20}H_{16}O_{10}$ Compd., m. 217–8°, from quinone, 3695[2].
β-Resorcylic acid, 4-β-resorcylate, triacetate, 2488[9].
$C_{20}H_{17}AsN_2O_5$ Benzenearsonic acid, 3,4-dibenzamido-, 1605[9].
$C_{20}H_{17}Br_2NOS_2$ Rhodanine, 5-(α,β-dibromo-β-phenylpropylidene)-3-(2,5-xylyl)-, 1080[4].
$C_{20}H_{17}ClN_4O_4$ m-Phenylenediamine, 5-chloro-2,4-dinitro-N,N′-di-p-tolyl-, 1222[7].
$C_{20}H_{17}Mo_2NO_{22}$ Pyridine monogallatodimolybdate, 3406[1].
$C_{20}H_{17}NO$ Dimethylene-1,3-oxaimine, 2,3,3-triphenyl-, 421[3].
Toluamide, α,α-diphenyl-, 591[6,7].
$C_{20}H_{17}NOS_2$ Rhodanine, 5-cinnamal-3-(2,5-xylyl)-, 1080[4].
$C_{20}H_{17}NO_2$ 5,6-Benzocinchoninic acid, 1,2,3,4-tetrahydro-3-phenyl-, 2231[5].
Cinnamic alcohol, 1-naphthalenecarbamate, 1232[9].
Toluhydroxamic acid, α,α-diphenyl-, 591[6,7].

$C_{20}H_{17}NO_3$ 4 - Quinolineacrylic acid, 6 - methoxy - 2 - phenyl-, Me ester, 1413^{4}.
$C_{20}H_{17}NO_4$ (See also *Berberine.*)
Muconamic acid, β,γ - dihydroxy - α, δ - di-*p*-tolyl-, lactone, 2849^{6}.
$C_{20}H_{17}NO_5$ Oxyberberine, 1085^{9}.
$C_{20}H_{17}N_3$ Benzaldehyde, *o* - benzalaminophenylhydrazone, 745^{7}.
$C_{20}H_{17}N_3O_3$ Compd., decomps. 167°, from $ClCH_2CO_2H$ and KCN, *and salts*, 2996^{4}.
$C_{20}H_{17}N_3O_5$ 3,4 - Pyrazoledicarboxylic acid, 1-[*p* - (*p* - acetamidophenyl)phenyl] - 5 - methyl-, *and K salts*, 599^{2}.
$C_{20}H_{17}N_5$ Compd., m. 222–3°, from benzoyl-*C* - iminodiphenyltetrazolium betaine, 1224^{8}.
$C_{20}H_{17}N_5S$ Phenazine, 2 - amino - 3 - (thio - β *o* tolylcarbamido)-, 1805^{7}.
$C_{20}H_{18}$ Butadiine, di(2,4 - xylyl)-, 1783^{4}.
$C_{20}H_{18}Br_6N_2$ Isoquinoline, -HBr, $C_2H_2Br_4$ addn. compd., 1086^{5}.
Quinoline, -HBr, $C_2H_2Br_4$ addn. compd., 1086^{5}.
$C_{20}H_{18}Cl_2N_2O_4$ Biacetoacetanilide, dichloro-, 3822^{4}.
$C_{20}H_{18}Cl_2O_4Sn$ Stannane, bis(acetylphenacyl)-dichloro-, 403^{1}.
$C_{20}H_{18}Cl_2O_4Zr$ Bis(α - acetylphenacyl)zirconium dichloride, 403^{1}.
$C_{20}H_{18}Cl_6O_4$ Diisoeugenol, hexachloro-, 748^{2}.
$C_{20}H_{18}CuO_4$ Acrylophenone, β - hydroxy - *p* - methyl-, Cu deriv., 1590^{8}.
$C_{20}H_{18}CuO_6$ Acrylophenone, β - hydroxy - *p* - methoxy-, Cu deriv., 1590^{8}.
$C_{20}H_{18}Hg$ 1 - Butine, 1,1' - mercuribis[4 - phenyl-, 1054^{2}.
$C_{20}H_{18}N_2$ Acetamidine, *N*, *N*, *N'* - triphenyl-, 1709^{4}.
Benzylamine, *N* - phenyl - α - (*o* - tolylimino)-, 1799^{5}.
$C_{20}H_{18}N_2O_2$ Carbanilide, *p* - methyl - *p'* - phenoxy-, 1603^{4}.
1,4 - Naphthylenediamine, *N*, *N'* - diacetyl-5-phenyl-, 1401^{6}.
$C_{20}H_{18}N_2O_4$ 6,12(5_1,11_1) - Diindolouretedione, 5_1,11_1 - dihydroxy - 2,4,8,10 - tetramethyl-, 2160^{7}.
β - Isatoid, tetramethyl-, 2160^{7}.
4 - Pyrazolecarboxylic acid, 5 - methyl - 3 - (3,4 - methylenedioxyphenyl) - 1 - phenyl-, Et ester, 599^{8}.
$C_{20}H_{18}N_2O_6$ Indigotin, 4,7,4',7' - tetramethoxy-, 178^{9}.
$C_{20}H_{18}N_4$ Buzylene, 3 - benzal - 2 - benzyl - 1-phenyl-, 2992^{8}.
$C_{20}H_{18}N_4O$ Anisaldehyde, α - phenylazo-, phenylhydrazone, 2992^{5}.
$C_{20}H_{18}N_4O_7$ Acridine, 1,2,3,4 - tetrahydro - 2 - (or 4) - methyl-, picrate, 1628^{6}.
Benzoquinoline, tetrahydromethyl-, 1627^{9}, 1628^{1}.
$C_{20}H_{18}N_4O_7S$ 2 - Thiophenemethylamine, *N*-allyl - *N* - phenyl-, picrate, 390^{8}.
$C_{20}H_{18}N_4O_8$ Benzylamine, phenoxymethyl-, picrate, 391^{6,7}.
$C_{20}H_{18}O$ Benzohydrol, *p* - (*p* - tolyl)-, 1988^{2}.
Cyclohexanone, dibenzal-, 1792^{7}.
$C_{20}H_{18}O_2$ Terephthalyl alcohol, α,α' - diphenyl-, 3451^{8}.
$C_{20}H_{18}O_2Sn$ Acetic acid, (triphenylstannyl)-, 1607^{8}.
$C_{20}H_{18}O_3$ Benzyl alcohol, *o* - (*p*,*p'* - dihydroxybenzohydryl)-, 1251^{6}.
$C_{20}H_{18}O_4$ Chromone, 3 - benzyl - 7 - hydroxy-2,5 - dimethyl-, acetate, 197^{2}.
3 - Furancarboxylic acid, 3 - benzyl - 2,3-dihydro - 2 - keto - 5 - phenyl-, Et ester, 404^{7}.
$C_{20}H_{18}O_5$ Cinnamic anhydride, *p*,*p'* - dimethoxy-, 196^{4}.
$C_{20}H_{18}O_6$ 1,9(or 1,10) - Anthradiol, 2,7 - dimethoxy-, diacetate, 411^{7}.
Chromone, 5 - hydroxy - 3,7 - dimethoxy-2 -(*p*- methoxystyryl)-, 196^{4}.
$C_{20}H_{18}O_7$ Chromone, 2 - (3,4 - dimethoxystyryl)-5,7 - dihydroxy - 3 - methoxy-, 196^{4}.
$C_{20}H_{18}O_8$ Tartaric acid, dibenzoate, di-Me ester, 1789^{5}.
$C_{20}H_{18}O_9$ Alizarin, glucoside, 2679^{3}.
Chrysazin, glucoside, 2679^{4}.
$C_{20}H_{18}O_{10}$ Purpurin, glucoside, 2679^{4}.
$C_{20}H_{19}BrPb$ Plumbane, bromodiphenyl - 2,5-xylyl-, 2669^{1}.
$C_{20}H_{19}Cl_4FeO_6$ 2,3,7,8(and 2,3,8,9) - Tetramethoxy - 2,3 - indeno - 3,2 - γ - benzopyrylium ferrichloride, 2326^{4,5}.
$C_{20}H_{19}HgI_2N_2$ Quinoline, complex salt with EtI and HgI_2, 3695^{9}.
$C_{20}H_{19}N$ Compd., m. 88°, from piperidine and BzH, 2849^{3}.
Dibenzylamine, *N*-phenyl-, 2155^{9}.
$C_{20}H_{19}NO$ Benzohydrol, α - (α - aminobenzyl)-, 588^{8}.
$C_{20}H_{19}NO_2$ Benzyl alcohol, α - ethyl-, 1 - naphthalenecarbamate, 1232^{9}.
Cinchophen, 6 - methyl-, Pr ester, *salts*, P 424^{7}.
Truxillimide, *N* - ethyl-, 1391^{9}, 1392^{7}.
$C_{20}H_{19}NO_2S$ *p* - Toluenesulfonanilide, *N* - methyl-*p*-phenyl-, 2848^{7}.
$C_{20}H_{19}NO_3$ Acetanilide, *m*(and *p*) - (β - *p* - methoxycinnamylvinyl)-, *salts*, 2156^{9}, 2157^{1}.
4 - Quinolinepropionic acid, 6 - methoxy - 2 - phenyl-, Me ester, 1413^{5}.
$C_{20}H_{19}NO_4$ Anhydrodihydroprotopine A, 3297^{9}.
Columbamine, 3294^{9}.
Jatrorrhizine, 603^{9}
Palmatrubine, 3294^{7}.
Paraberine, 7,12 - dihydro - 2,3(or 9,10)-dimethoxy - 9,10(or 2,3) - methylenedioxy-, *and salts*, 1084^{3}
Truxillacetamidic acid, 1392^{5}.
$C_{20}H_{19}NO_5$ Anydrodihydroprotopine oxide, *and -HCl*, 3298^{1}.
Protopine, 3297^{8}.
$C_{20}H_{19}NO_6$ 1,3(2,4) - Isoquinolinedione, 6,7-(and 7,8) - methylenedioxy - 2 - (veratrylmethyl)-, 3297^{7}.
$C_{20}H_{19}NO_7$ Homophthal - 1 - amic acid, 3,4-methylenedioxy - *N* - piperonylmethyl-, Me ester, 3297^{9}.
$C_{20}H_{19}N_3$ Aniline, *N*, *N* - dimethyl - *p* - (*p*-phenylphenylazo)-, *and -HCl*, 585^{4}.
$C_{20}H_{19}N_5$ Indanine - 3 - azodimethylaniline, 2836^{7}.
Quinonediimine, *N* - [*p* - (*p* - dimethylaminophenylazo)phenyl]-, 2836^{7}.
$C_{20}H_{19}N_5O_6$ Guanidine, β - (γ - methyl - Δ^3-butenyl) - α,γ - bis(*m* - nitrobenzoyl)-, 1057^{9}.
$C_{20}H_{19}N_5S_2$ Semicarbazide, 4 - phenyl - 1 - [*o*-(β-phenylthiocarbamido)phenyl]-, 745^{7}.
$C_{20}H_{20}As_2I_2N_4O_6$ *p* - Arsenophenol, 3,5,3',5'-tetraacetamido -2,2'- diiodo-, 1607^{8}.
$C_{20}H_{20}BrNO_3$ Norcodeine, bromo - *N* - propargyl , 3012^{6}.

$C_{20}H_{20}ClNO_4$ Isodihydroprotopine - β - chloride, 3297[9].

$C_{20}H_{20}Cl_2N_2O_2$ Naphthalene, 1,2 - dihydro-, bisnitrosochloride, 383[2].

$C_{20}H_{20}CoMoN_4O_4$ Cobalt pyridine molybdate, 1185[1].

$C_{20}H_{20}HgI_4N_2$ Quinoline, complex salt with MeI and HgI_2, 3695[9].

$C_{20}H_{20}INO_2$ α - Anisal - 4 - methoxy - 1 - methylquinaldinium iodide, 1626[2].

$C_{20}H_{20}INO_6$ 3,4 - Dihydro - 2 - methyl - 6,7-methylenedioxy - 1 - veratroylisoquinolinium iodide, 206[1].

$C_{20}H_{20}N_2$ Phenylenediamine, dimethyldiphenyl-, 3161[5].

$C_{20}H_{20}N_2O_2$ Carbamic acid, [β - (2 - phenyl - 4-quinolyl)ethyl]-, Et ester, 1413[5].

6,12 - Indoloquinazolinedione, 11,11₁ - dihydro - 2,4,8,10,11 - pentamethyl-, 2160[7].

4 - Pyrazolecarboxylic acid, 5 - methyl - 3 - phenyl - 1 - p - tolyl-, Et ester, 599[5].

$C_{20}H_{20}N_2O_2S$ Thiochromone, 3 - (N - acetyl-p dimethylaminoanilino) - 6 - methyl-, 203[3].

$C_{20}H_{20}N_2O_3$ 4 - Pyrazolecarboxylic acid, 3 - p-anisyl - 5 - methyl - 1 - phenyl-, Et ester, 599[5].

$C_{20}H_{20}N_2O_4$ 1 - Anthracenebicarbamic acid, di-Et ester, 410[7].

9 - Phenanthrenebicarbamic acid, di-Et ester, 410[7].

Truxillamidic acid, N-ethylnitroso-, 1392[6].

$C_{20}H_{20}N_2O_4S_2$ Cystine, N, N′-dibenzal, 1815[3]

$C_{20}H_{20}N_2O_6S_2$ Cystine, N, N′ - disalicylal, *l* 3 *salt*, 1815[3].

Oxanilic acid, o,o′ - dithiobis-, di Et ester, 600[1].

Succinanilic acid, o,o′ dithiobis, 600[1].

$C_{20}H_{20}N_4O_4$ Acetoacetanilide, p,p′ - azobis, P 1910[7].

$C_{20}H_{20}N_4O_5$ Acetoacetanilide, p,p′ - azoxybis, P 1910[7].

$C_{20}H_{20}N_4O_6$ Naphthalene, 1,2 - dihydro, pseudo nitrosite, 383[1].

$C_{20}H_{20}N_4O_7$ Carbazole, 1,2,3,4 - tetrahydro 3,6 dimethyl, picrate, 2831[4]

$C_{20}H_{20}O_4$ Phenanthrene, 3,4,6,7 tetramethoxy 1-vinyl, 1406[2].

β - Truxinic acid, mono Et ester, 2664[9].

$C_{20}H_{20}O_4SSe$ Anthraquinone, 1 (butylsulfonyl) 5 (ethylselenyl)-, 1051[4].

$C_{20}H_{20}O_5$ 1 - Indanone, 5,6 - dimethoxy - 2 - (2,3 - dimethoxybenzal), 2320[4]

$C_{20}H_{20}O_6$ Phloroglucinol, 2 - phenethyl, triacetate, 1225[9]

$C_{20}H_{20}O_7$ 1,4 - Benzopyran, 4 - (3,4 dimethoxy phenyl) - 5,7 - dimethoxy - 2,3 - methylenedioxy, 2489[6].

Coumarin, 4 - (3,4 - dimethoxyphenyl)-3,5,7-trimethoxy-, 2489[6].

Flavone, pentamethoxy-, 1991[1]

$C_{20}H_{20}S$ Thiophene, 2,4 - diethyl - 3,5 - diphenyl-(?), 502[4].

$C_{20}H_{21}Br_2NO_3$ Norcodeine, N - β,γ dibromoallyl-, 3012[6].

$C_{20}H_{21}ClO_6$ 5,7 - Dimethoxy - 2 - (3,4,5 - trimethoxyphenyl)benzopyrylium chloride, *and FeCl₃ compd.*, 3457[8].

$C_{20}H_{21}ClO_{10}$ 5,7 - Dimethoxy - 2 - (3,4,5 - trimethoxyphenyl)benzopyrylium perchlorate, 3457[1].

$C_{20}H_{21}Cl_4FeO_6$ 5,7 - Dimethoxy - 2 - (3,4,5 trimethoxyphenyl)benzopyrylium chloride, $FeCl_3$ compd., 3457[8].

$C_{20}H_{21}NO$ Lepidine, 6 - isobutoxy - 2 - phenyl-, 418[7].

$C_{20}H_{21}NO_2$ Camphorimide, N - 2 - naphthyl-, 1800[7].

$C_{20}H_{21}NO_3$ Norcodeine, N-propargyl-, 3012[6].

Truxillamidic acid, Et ester, 1391[9], 1392[6].

—, N-ethyl-, 1392[6].

β-Truxinamic acid, Et ester, 2664[9].

—, N-ethyl-, 2664[9].

$C_{20}H_{21}NO_4$ (See also *Papaverine*.)

Dicentrine, 1085[6], *and - HCl*, 206[1,2].

Paraberine, 7,12,12₁,13 - tetrahydro - 2,3-dimethoxy - 9,10 - methylenedioxy, *and - HCl*, 1084[3].

$C_{20}H_{21}NO_7$ Homophthal - 1 - amic acid, 3,4-methylenedioxy - N - veratrylmethyl-, 3297[7].

$C_{20}H_{21}N_3O_2$ 4(1) - Quinazolone, 2 - (p - dimethylaminostyryl) - 7 - methoxy - 1 - methyl-, 207[5]

$C_{20}H_{21}N_3O_3$ Hydantoin, 5 - (δ - benzamidobutyl)-3-phenyl, 2148[1].

$C_{20}H_{21}N_3O_6$ Cinnamic acid, nitro(nitrophenyl)-, piperidine salt, 1801[1].

$C_{20}H_{21}N_3O_8$ Isoquinoline, 1,2,3,4 - tetrahydro-8 - methoxy - 1 - (3 - methoxy - 2,4 - di nitrobenzyl) 2 - methyl 6,7 - methylenedioxy-, 3457[9]

$C_{20}H_{22}AsClN_2O_3$ Quinine, arsinosochloro-, 1629[6]

$C_{20}H_{22}Ba_2N_2O_{14}$ + $6H_2O$, 720[3]

$C_{20}H_{22}Ca_2N_2O_{14}$ + $4H_2O$, 720[3]

$C_{20}H_{22}ClNO_2$ 4 - (p - Dimethylaminophenyl)-7 - methoxy 2,3 dimethylbenzopyrylium chloride, 3455[1].

$C_{20}H_{22}ClNO_6$ 4 - (p - Dimethylaminophenyl) 7 methoxy - 2,3 dimethylbenzopyrylium perchlorate, 3455[1].

$C_{20}H_{22}INO_4$ 3,4 - Dihydro - 2 - methyl 6,7 methylenedioxy 1 - veratrylisoquinolinium iodide, 206[1]

$C_{20}H_{22}N_2O$ 9 Anthrol, 1,2,3,4,5,6,7,8 octahydro 10 phenylazo, 1404[3]

$C_{20}H_{22}N_2O_2$ Piperazine, 1,4 - dibenzoyl - 2,5 dimethyl, 2082[3,4].

$C_{20}H_{22}N_2O_4$ Butyric acid, α,γ dibenzamido, Et ester, 2983[1]

Lysuric acid, 2147[9], 2084[7]

Malanilide, N, N′ dimethyl, acetate, 1036[8]

Ornithuric acid, Me ester, 2083[7]

$C_{20}H_{22}N_2O_6$ Isoquinoline, 1,2,3,4 tetrahydro 2 - methyl - 6,7 methylenedioxy - 1 (6 - nitroveratryl)-, *and - HI*, 206[1]

$C_{20}H_{22}N_2O_6Sn$ + $2H_2O$ Ethylenediamine tri pyrocatecholatostannate, 3404[9].

$C_{20}H_{22}N_2O_{14}$ Phenolglucotetraacetate, dinitro, 2487[3].

$C_{20}H_{22}N_2O_{14}Pb_2$, 720[3].

$C_{20}H_{22}N_2O_{14}Sr_2$ + $6H_2O$, 720[3].

$C_{20}H_{22}N_4O_7$ Quinoline, 1,2 - dihydro - 2 - isobutyl 1 - methyl-, picrate, 1082[1].

$C_{20}H_{22}N_4O_8$ Biscarbamic acid, N, N″ - p - biphenylenebis-, tetra-Me ester, 410[6].

$C_{20}H_{22}O$ Acetaldehyde, cyclohexyldiphenyl, 1988[9].

Acetophenone, α - cyclohexyl - α - phenyl-, 1988[9].

Ketone, benzohydryl cyclohexyl, 1988[9].

$C_{20}H_{22}O_3$ Acetoacetic acid, α,α - dibenzyl-, Et ester, 2323[1].

$C_{20}H_{22}O_4$ Phenolglutarein, 4 - ethyl - 4 - methyl-, 2070[7].

Phenolsuccinein, 3,3-diethyl-, 2676[7].

$C_{20}H_{22}O_4S_2$ 1 - Propanol, 3,3' - dithiobis-, dibenzoate, 737[3].

$C_{20}H_{22}O_5$ *p* - Toluic acid, *α* - hydroxy-, *α* - ethoxy-*p*-toluate, Et ester, 378[9].

$C_{20}H_{22}O_6$ Succinic acid, *α*,*β* - dimethoxy-, dibenzyl ester, 47[8].

$C_{20}H_{22}O_7$ Chalcone, 2 - hydroxy - 4,6,3',4',5'-pentamethoxy-, 3457[3].

$C_{20}H_{23}As_2Cl_7N_2O_2$ Compd. from dehydroquinine and $AsCl_3$, 1629[6].

$C_{20}H_{23}BrO_6$ Epicatechol, bromopentamethyl-, 382[8].

$C_{20}H_{23}CuNO_2$ Cuminoin, oxime,. Cu deriv., 1055[6].

$C_{20}H_{23}NO$ Acetaldehyde, cyclohexyldiphenyl, oxime, 1989[1].

Benzanilide, 2' - benzyl - *ar'* - hexahydro, 2665[7,8].

$C_{20}H_{23}NO_2$ Ethylamine, *β* - (6,7 - dimethoxy-1 - phenanthryl) - *N*, *N* - dimethyl-, *and* - *HCl*, 3458[4].

$C_{20}H_{23}NO_3$ Camphoramic acid, *N* - 2 - naphthyl-, 1800[7].

$C_{20}H_{23}NO_4$ Columbamine, tetrahydro, 3294[9]

Corypalmine, 915[9]

Isoquinoline, 1,2,3,4 tetrahydro 2 - methyl 6,7 - methylenedioxy - 1 - veratryl-, *and salts*, 206[1].

Jatrorrhizine, tetrahydro-, 604[1], 1085[9].

Neopine, acetyl, 2332.

Palmatrubine, tetrahydro, 3295[2].

$C_{20}H_{23}NO_6$ Butyric acid, *α* (*α* - carbamyl - *α* hydroxy - *γ* phenylpropoxy) - *α* - hydroxy *γ* phenyl, 1232[6], 1798[5], 2673[5].

$C_{20}H_{23}N_3O_4$ Lysine, *N*[ε] benzoyl - *N*[α] - phenylcarbamyl, 2148[5]

$C_{20}H_{23}N_3O_6$ Isoquinoline, 1 (4 - amino - 3 - methoxy 2 nitrobenzyl) - 1,2,3,4-tetrahydro 8 - methoxy 2 - methyl 6,7-methylenedioxy, 3458[2].

$C_{20}H_{23}N_3O_7$ Isoquinoline, 1,2,3,4 - tetrahydro 6,7 dimethoxy 1 (3 - methoxy - 2,4-dinitrobenzyl) 2 - methyl, 3458[1].

$C_{20}H_{24}$ Binaphthyl, decahydro, 1102[5].

Tetracyclopentadiene, 2148[6]

$C_{20}H_{24}Br_2N_4$ Spiro[isoindole - 2,1' - piperazine-4',2'' - isoindole], *N*, *N'* dibromo-1,3,1'',3'' tetrahydro-, 2862[5].

$C_{20}H_{24}Br_2N_2O_2$ 2 Quinuclidinecarbinol, 5 bromo - 5 (*α* bromoethyl) - *α* - (6-methoxy 4-quinolyl), 1993[9].

$C_{20}H_{24}MoN_2O_5$ + nH_2O, 3656[7]

$C_{20}H_{24}N_2$ Isoquinoline, 2,2' ethylenebis[1,2,3,4 tetrahydro, *and salts*, 2862[5,6]

Δ^2 - Pyrazoline, 3 - *tert* butyl 5 - phenyl 1 *o* (and *p*)-tolyl-, 762[5].

$C_{20}H_{24}N_2O$ Benzamide, *N* - (1,3 dihydro 2 isoindyl)amyl, 418[2].

-, *N*-*o*-1 piperidylmethylbenzyl, 118[7].

$C_{20}H_{24}N_2O_2$ (See also *Quinidine*; *Quinine*.)

1 - Propanone, 3 - (3 - ethylidene - 4 - piperidyl) - 1 - (6 - methoxy - 4 quinolyl), 1993[8].

Quinuclidine, 5 - ethylidene - 2 [(6 hydroxy - 4 - quinolyl) methoxymethyl] -, 1993[9].

2 - Quinuclidinecarbinol, 5 - ethylidene *α* - (6 - methoxy - 4 - quinolyl), and - *HCl*, 1993[7,8].

$C_{20}H_{24}N_2O_3$ Nitrone, *α* - [*β* - (*N* - hydroxyanilino)isobutyl] *α* methyl *N* phenyl (?), acetate, 2837[4].

2 - Pentanone, 4 - (*N* hydroxyanilino) 4-methyl-, cyclic *N* - phenyloxime(?), acetate, 2837[4].

2 - Quinuclidinecarbinol, 5 - ethylidene - *α*-(6 - methoxy - 4 - quinolyl)-, oxide, 1993[8].

$C_{20}H_{24}N_2O_4$ Acetophenone, 3,4 - dimethoxy-, azine, 2321[8].

Carbanilic acid, *N*, *N'* - ethylenebis-, di-Et ester, 3164[5].

Isoquinoline, 1 - (6 - aminoveratryl) - 1,2,3,4-tetrahydro - 2 - methyl - 6,9 - methylenedioxy-, *and di-HCl*, 206[2].

$C_{20}H_{24}N_2O_4S$ 1 - Propanol, 3,3' thiobis-, dicarbanilate, 362[8].

$C_{20}H_{24}N_2O_5S$ Lysine, *N*[ε] - benzoyl - *N*[α] - *p*-tolylsulfonyl, 3690[5].

Ornithine, *N*[δ] - benzoyl - *N*[α] - methyl-*N*[α]-*p*-tolylsulfonyl-, 3690[9].

$C_{20}H_{24}N_2O_6$ 3 - Pyrrolecarboxylic acid, 2,2'-ethylenebis[5 - formyl - 4 - methyl, di-Et ester, 2159[6].

$C_{20}H_{24}N_2O_7$ Benzoic acid, 3,4,5 - trimethoxy-, 3,4,5-trimethoxybenzalhydrazide, 2672[3].

$C_{20}H_{24}N_2O_8$ Hydrazine, *s* - bis(3,4,5 - trimethoxybenzoyl)-, 2672[4].

$C_{20}H_{24}N_4O_4$ Compd, m 151°, from Et 2,4-dimethyl - 3 - pyrrolecarboxylate, pyridine, and BrCN, 1621[4].

$C_{20}H_{24}N_4O_4$ Hydrazinedicarboxylic dianilide, acetoneglyceryl-, 2816[1]

$C_{20}H_{24}N_6O_6$ 2 - Pyrrolecarboxylic acid, *N*, *N'*-acetylenediaminobis[3 - carbamyl 4 - methyl-, diethyl ester, 3455[6].

$C_{20}H_{24}O$ 2 Octanone, 1,1-diphenyl-, 1786[6].

$C_{20}H_{24}O_2$ Cumic acid, *p* - isopropylbenzyl ester, 1793[5].

p - Dioxane, 2,2,5,5 - tetramethyl 3,6-diphenyl-, 2850[5]

Hydrobenzein, *α* cyclohexyl-, 1988[9].

$C_{20}H_{24}O_3$ Camphor, 3 - (hydroxymethyl)-, cinnamate, 1228[1].

$C_{20}H_{24}O_6$ Erysimupicron, 2690[9], 2691[1].

Stilbene, 2,4,6,3',4' - pentamethoxy - *α*-methyl, 405[5], 3007[8]

o Veratric acid, 6 - [*β* - (4 - isopropyl-3 - keto - Δ^1 - cyclohexenyl)vinyl]-, *and Ca salt*, 3457[8].

$C_{20}H_{24}O_6$ Chroman, 4 (3,4 - dimethoxyphenyl)-3,5,7 - trimethoxy-, 2489[7]

Epicatechol, pentamethyl, 382[4]

Pseudocatechol, pentamethyl-, 3007[3]

$C_{20}H_{24}O_7$ 1,2,3 - Cyclobutanetricarboxylic acid, 2 benzoyl-, tri Et ester, 49[2]

$C_{20}H_{25}AsCl_4N_2O_2$ Compd. from quinine and $AsCl_3$, 1629[6].

$C_{20}H_{25}ClN_2O_4S$ Acetic acid, chlorosulfo-, hydroxyhydrindamine salt, 3445[4].

$C_{20}H_{25}IN_2O_2$ Apoquinine, methiodide, 1993[9].

$C_{20}H_{25}NO$ Isobutyramide, *N*, *N* - diethyl - *β*,*β'*-diphenyl, 2997[6], 3451[9]

$C_{20}H_{25}NO_2$ Cuminoin, oxime, 1055[7].

$C_{20}H_{25}NO_4$ Dinicotinic acid, 1,4 - dihydro 1,2,6 - trimethyl - 4 - phenyl-, di-Et ester, 3296[3].

$C_{20}H_{25}NO_6$ Ozocodeine, dihydro, acetate, 2165[5].

$C_{20}H_{25}N_3O_2$ Base, m. 201 2°, from dicyclopentadiene, 384[7].

Valeramidine, *N'* - *p* - phenetyl - *N* - phenylcarbamyl, 1218[6].

$C_{20}H_{25}N_3O_5$ Isoquinoline, 1 - (4 - amino - 3-methoxy - 2 - nitrobenzyl) - 1,2,3,4-tetrahydro - 6,7 dimethoxy - 2 - methyl-, 3458[2].

$C_{20}H_{25}N_3O_7$ Succinic acid, *α* - (*p* - acetamido-

phenylazo) - α, β - diacetyl-, di-Et ester, 598^{8}.
$C_{20}H_{25}N_5O_7$ Pyrrole, 2-ethyl-3-methyl-, picrate, 3455^{5}.
$C_{20}H_{26}AsBr$ Benzylcyclohexylmethylphenylarsonium bromide, 2839^{6}.
$C_{20}H_{26}N_2O_2$ (See also *Hydroquinine.*)
Butyramidine, *N, N'* - di - *p* - phenethyl-, 1218^{5}.
Niquine, *N*-methyl-, 1994^{1}.
$C_{20}H_{26}N_2O_4S_2$ Dibenzenesulfonamide, *N*-δ-(tetrahydro - 1 - pyrryl)butyl-, 417^{9}.
Piperazine, 2,5(and 2,6) - dimethyl - 1,4-bis(*p* - tolylsulfonyl)-, 2682^{2}.
$C_{20}H_{26}N_4O_6$ Hydrocinnamamide, β - amino-, oxalate, 1066^{7}.
3 Pyrrolecarboxylic acid, 2,2' - ethylenebis[5 - formyl - 4 - methyl-, di - Et ester, dioxime, 2159^{6}.
$C_{20}H_{26}N_4O_9$ 2 - Propanol, 1,1' - phenyliminobis[2 - methyl-, picrate, 2834^{4}.
$C_{20}H_{26}O_2$ 1,2 - Octanediol, 1,1 - diphenyl-, 1786^{5}.
$C_{20}H_{26}O_2S$ Sulfide, bis(γ - *p* - toloxypropyl), 362^{9}.
$C_{20}H_{26}O_3$ Camphor, 3 - (hydroxymethyl)-, hydrocinnamate, 1228^{1}.
$C_{20}H_{26}O_6$ Bibenzyl, 2,4,6,3',4' - pentamethoxy-α-methyl-, 405^{5}, 3007^{8}.
$C_{20}H_{27}AsCl_4N_2O_2$ Compd. from dihydroquinine and $AsCl_3$, 1629^{8}.
$C_{20}H_{27}BrN_2O_5$ Proline, 1 - tyrosyl , α - bromoisocaproyl deriv., 3169^{9}.
$C_{20}H_{27}NO_2$ Dibenzylamine, bis(ethoxymethyl)-, $391^{6,7}$.
$C_{20}H_{27}NO_6$ 5 - Desoxymorphinic acid, dihydro-, Me ester, acetate, 2165^{6}.
$C_{20}H_{27}NO_{11}$ + $3H_2O$ See *Amygdalin.*
$C_{20}H_{27}N_3O_3$ Isoquinoline, 1 - (2,4 - diamino-3 - methoxybenzyl) - 1,2,3,4 - tetrahydro-6,7 - dimethoxy - 2 - methyl-, *and di-HCl*, 3458^{2}.
$C_{20}H_{28}$ Tetracyclopentadiene, tetrahydro-, 2148^{6}.
$C_{20}H_{28}N_2O_4$ Benzylamine, α - ethyl-, oxalate, 900^{1}.
$C_{20}H_{28}N_2O_6$ Nipecotic acid, 4 - hydroxy - 1 isoamyl-, Et ester, *p* - nitrobenzoate, - *HCl*, 3010^{8}.
$C_{20}H_{28}N_2O_{10}S_2$ Butyric acid, β - sulfo-, benzidine salt, 1979^{4}.
$C_{20}H_{28}N_4O_4$ Arabinose, methyl[*p* - (*p* - α - methylhydrazinobenzyl)phenyl]hydrazone, 904^{8}.
$C_{20}H_{28}O_3$ Ketone, hydroxymethyl 1,2,2,3 - tetramethylcyclopentyl, hydrocinnamate, 1399^{6}.
$C_{20}H_{28}O_{14}$ Cellobiose anhydride, tetra-Ac deriv., 381^{3}.
$C_{20}H_{29}BrHgO_3$ Hydrocinnamic acid, α - bromomercuri - β - methoxy-, menthyl ester, 1986^{8}.
$C_{20}H_{29}ClHgO_3$ Hydrocinnamic acid, α - chloromercuri - β - methoxy-, menthyl ester, 1986^{8}.
$C_{20}H_{29}HgIO_3$ Hydrocinnamic acid, α- -iodomercuri - β - methoxy-, menthyl ester, 1986^{8}.
$C_{20}H_{29}NO_4$ Nipecotic acid, 1 - amyl - 4 - hydroxy-, Et ester, benzoate, - *HCl*, 3010^{3}.
—, 4 - hydroxy - 1 - isoamyl-, Et ester, benzoate, - *HCl*, 3010^{9}.
$C_{20}H_{29}N_3O_5$ Proline, 1 - tyrosyl-, leucyl deriv., 3169^{9}.
$C_{20}H_{30}$ Diterebenthyl, 1320^{3}.
Naphthalene, cymyldecahydro-, 1402^{8}.
$C_{20}H_{30}Cl_2O_2$ Camphor, 3 - chloro-, dimer(?), 2157^{8}.
$C_{20}H_{30}N_2O_4$ Nipecotic acid, 4 - hydroxy - 1 isoamyl-, Et ester, *p* - aminobenzoate, *di-HCl*, 3010^{5}.
$C_{20}H_{30}O_2$ (See also *Abietic acid.*)
Acid from Japanese sardine oil, 834^{3}.
Densipimaric acid, 766^{8}.
Pimaric acid, 832^{3}.
Pineic acid, 3458^{7}.
$C_{20}H_{31}N_7O_7$ Carbodiimide, dipropyl-, semipicrate, 374^{9}.
$C_{20}H_{32}$ Diterpene from terpenes and H_3PO_4, 1070^{5}.
Hydrocarbon from Yaryan rosin, 299^{6}.
$(C_{20}H_{32})x$ Polycyclo-rubber, 3588^{1}.
$C_{20}H_{32}AsI$ Dicyclohexylethylphenylarsonium iodide, 2839^{6}.
$C_{20}H_{32}CoN_6O_6S_2$, 2924^{1}.
$C_{20}H_{32}O_2$ Abietic, acid, dihydro-, 766^{9}.
Acid from Japanese sardine oil, 834^{3}.
Acid from ox-liver oil, 833^{5}.
Densipimaric acid, dihydro-, 766^{8}.
$C_{20}H_{32}O_4$, 2756^{8}.
$(C_{20}H_{34})x$ Hydro polycyclo-rubber, 3558^{1}.
$C_{20}H_{34}CuO_4$ 2,4 - Pentanedione, 3 - β - methylbutyl-, Cu deriv., 413^{7}.
$C_{20}H_{34}Hg$ 1 - Decine, 1,1' - mercuribis-, 1054^{2}.
$C_{20}H_{34}O_2$ 1,1' - Bimenthone, 1614^{6}.
Pinacol, b.₄ 183°, from 2-methyl-6-methylene - Δ^7 - 4 - octenone, 407^{6}.
$C_{20}H_{36}N_2O_2$ 1,1' - Bimenthone, dioxime, 1614^{8}.
$C_{20}H_{36}N_6O_2$ 3,3' - Bi[cyclohexane] - 1,1' - dione, 3,3',5,5,5',5' - hexamethyl , disemicarbazone, 1784^{5}.
$C_{20}H_{36}O_2$ Acetic acid, chaulmoogryl-, 3160^{5}.
Δ^3 - 2 - Decenone, dimer, 1602^{3}.
$C_{20}H_{37}BrO_2$ λ - Octadecenolic acid, λ(or μ)-bromo-, Et ester, 1591^{7}.
$C_{20}H_{37}IN_2$ 2 - Diisoamylamino - 1 - isoamylpyridinium iodide, 3009^{2}.
$C_{20}H_{38}$ Hydrocarbon from 1 - (bromomethyl)-1,2,2,3 - tetramethylcyclopentane, 1399^{1}.
$C_{20}H_{38}Br_2O_2$ Stearic acid, λ, μ - dibromo-, Et ester, 1591^{7}.
$C_{20}H_{38}O_2$ 1,1' - Bimenthol, 1614^{6}.
2,4 - Eicosanedione, 739^{1}.
λ - Octadecenoic acid, Et ester, 1591^{6}
$C_{20}H_{38}O_3$ Cyclohexanetridecoic acid, μ - hydroxy-, Me ester, 1590^{8}.
Stearic acid, β - keto-, Et ester, 2660^{7}.
$C_{20}H_{38}O_4$ 1,16 - Hexadecanedicarboxylic acid, di-Me ester, 1789^{3}; mono-Et ester, 47^{6}.
1,16 - Hexadecanediol, diacetate, 1789^{4}.
$C_{20}H_{38}O_{11}$ Cellobioside, heptamethylmethyl-, 1221^{3}.
Gentiobioside, heptamethylmethyl-, 1221^{3}.
$C_{20}H_{40}N_2$ 1,1' - Bi[3 - *p* - menthylamine], *di-HCl*, 1614^{7}.
$C_{20}H_{40}O_2$ Palmitic acid, Bu ester, 2818^{9}.
Stearic acid, Et ester, 1275^{4}, 2818^{9}.
$C_{20}H_{44}N_2O_2S$ Ethylamine, β, β' - sulfonylbis[*N, N* - dibutyl-, *and di-HCl*, 40^{9}.
$C_{20}H_{44}N_2S$ Ethylamine, β, β' - thiobis[*N, N* - dibutyl-, *and di-HCl*, 40^{3}.
$C_{20}H_{48}Cl_6N_6Pt$ α, α, β - Triethyl - β, γ, γ - trimethylguanidinium chloroplatinate, 374^{9}.
$C_{20}H_{54}N_6O_3$, 1635^{1}.
$C_{21}H_{10}ClN_3O_7$ Benzamide, *N* - anthraquinonyl-2 - chloro - 3,5 - dinitro-, 181^{8}.
$C_{21}H_{11}Cl_3N_2$ αγ - Dibenzophenazine, 10,12,13-trichloro - 11 - methyl-(?), 2884^{1}.

$C_{21}H_{11}Cl_4NOS_2$ 8 - Quinolinol, 5,7 - bis(2,5-dichlorophenylmercapto)-, 3289[7].
$C_{21}H_{12}BiCl_2N_3O_{12}$ Bismuthine, tris(4 - carboxy-? - nitrophenyl)-, dichloride, 1063[6].
$C_{21}H_{12}Br_2N_2S$ *β* - Naphthothiazole, 2 - (1 - naphthylamino)-, dibromo deriv., 195[3].
$C_{21}H_{12}Cl_2N_2$ *αγ* - Dibenzophenazine, 10,12-dichloro-11-methyl-, 2834[1].
$C_{21}H_{12}N_4$ 6,7 - Phenanthrazinoindazole, 1623[3].
$C_{21}H_{12}N_6O_9$ Isocyanuric acid, tris(*m*-nitrophenyl) ester, 1804[8].
$C_{21}H_{12}O_2$ 5,12 - *m* - *β* - Benzodiindenedione, 7-methyl-, 911[4].
$C_{21}H_{12}O_6$ Anthrapurpurin, 2 - benzoate, 3453[3].
$C_{21}H_{13}BrO$ Ketone, 10 - bromo - 9 - anthryl phenyl, 2852[5].
$C_{21}H_{13}Br_3$ Anthracene, 9 - benzyl - 2,3,10 - tribromo-, 3452[9].
$C_{21}H_{13}ClO$ Ketone, 10 - chloro - 9 - anthryl phenyl, 2852[4].
$C_{21}H_{13}ClO_2$ Chromone, 6 - chloro - 2,3 - diphenyl-, 1237[8].
Coumarin, 6 - chloro - 3,4 - diphenyl-, 1238[2].
$C_{21}H_{13}NO$ 14(7) - *γγ* - Dibenzacridone, 2677[2].
$C_{21}H_{13}N_7O_{14}$ Propane, 2 - (*m* - nitrophenyl)-1,3-dipicryl-, 3000[4].
$C_{21}H_{14}Br_2O$ Anthrone, 10 - bromo - 10 - (*α*-bromobenzyl)-, 3453[2].
$C_{21}H_{14}Br_2O_4S$ Sulfonefluoran, dibromo - 3,6-dimethyl-, 3001[5].
$C_{21}H_{14}Br_4N_2S$ *β* - Naphthothiazole, 2 - (1 - naphthylamino)-, tetrabromide, 195[2].
$C_{21}H_{14}Br_4O_5S$ *m* - Cresolsulfonephthalein, tetrabromo-, *and* NH_4 *salt*, 3001[4].
$C_{21}H_{14}Br_6N_2S$ Naphthothiazole, naphthylamino-, hexabromide, 195[4].
$C_{21}H_{14}ClNO_2$ Chromone, 6 - chloro - 2,3 - diphenyl-, oxime, 1237[9].
$C_{21}H_{14}Cl_2O$ Ketone, 9,10 - dichloro - 9,10 - dihydro 9-anthryl phenyl, 2852[5].
$C_{21}H_{14}N_2O_3$ 2(3) - Benzimidazolone, 1,3 - dibenzoyl-, 381[9].
$C_{21}H_{14}N_2O_4$ 1 - Naphthalenecarbamic acid, 1-nitro - 2 - naphthyl ester, 2319[6].
$C_{21}H_{14}N_2O_5$ Ketone, 9,10 - dihydro - 9,10 - dinitro - 9 - anthryl phenyl, 2852[6].
$C_{21}H_{14}N_2S$ Naphthothiazole, naphthylamino-, 195[4].
$C_{21}H_{14}N_4O_2S$ 1,2 - Naphthoquinone, thiocarbohydrazone, 1810[8].
$C_{21}H_{14}N_4O_4$ 4(3) - Quinazolone, 3 - benzamido-2 - (*m* - nitrophenyl)-, 206[9].
—, 3 - *m* - nitrobenzamido - 2 - phenyl-, 206[9].
$C_{21}H_{14}N_6O_5$ 6 - Phthalazinealdehyde, 1,2 - dihydro - 1 - keto - 2 - (*p* - nitrophenyl)-, *p* - nitrophenylhydrazone, 184[5].
$C_{21}H_{14}N_6O_{12}$ Propane, 2-phenyl-1,3-dipicryl-, 3000[3].
$C_{21}H_{14}O$ Anthrone, 10-benzal-, 3452[8].
Indone, 2,3-diphenyl-, 1407[9].
Ketone, 9 - anthryl phenyl, 2852[4].
$C_{21}H_{14}O_2$ Compd. from 10 - bromo - 10 - (*α*-bromobenzyl)anthrone, m. 133–4°, 3453[2].
$C_{21}H_{14}O_2S$ Carbonic acid, thiono-, di - 2 - naphthyl ester, 914[6].
$C_{21}H_{14}O_3$ $\Delta^{2,2'}$ - Biindan - 1,3,1' - trione, 2'-propylidene-, 911[5].
Chromone, 7 - hydroxy - 2,3 - diphenyl-, 196[7].
Umbelliferone, 3,4 - diphenyl-, 595[3].
$C_{21}H_{14}O_4$ Chromone, 7,8 - dihydroxy 2,3 diphenyl-, 197[2].
Coumarin, dihydroxy - 3,4 - diphenyl-, 595[4].
Spiro[indan - 2,1' - cyclopentane - 2',2''-indan] - 1,3,1'',3'' - tetrone, 185[9].
$C_{21}H_{14}O_6$ 7 - *meso* - Benzanthrenone, 5,6(or 8,9) - dihydroxy - , diacetate, 411[6].
$C_{21}H_{14}O_7$ Gallic acid, dibenzoate, 1987[1].
$C_{21}H_{15}BiCl_2O_6$ Bismuthine, tris[carboxyphenyl]-, dichlorides, 1063[5], 1984[7].
$C_{21}H_{15}Br$ Anthracene, 9 - benzyl - 10 - bromo-, 3452[9].
—, 9-(bromomethyl)-10-phenyl-, 3003[6].
$C_{21}H_{15}Br_3N_2S$ Naphthothiazole, naphthylamino-, tribromide, 195[3,4].
$C_{21}H_{15}Br_5$ Anthracene, 9 - benzyl - 1,2,3,4,10-pentabromo-1,2,3,4-tetrahydro-, 3452[9].
$C_{21}H_{15}Br_7N_2S$ *β* - Naphthothiazole, 2 - (1 - naphthylamino)-, heptabromide, 195[3].
$C_{21}H_{15}Cl$ Anthracene, 9 - benzyl - 10 - chloro-, 3453[1].
Propine, 3 - chloro - 1,3,3 - triphenyl-, 3004[1].
$C_{21}H_{15}ClO$ 9 - Styrylxanthylium chloride, 1806[9].
$C_{21}H_{15}ClO_4 + H_2O$ 3,6 - Dihydroxy - 9 - (*p*-hydroxystyryl)xanthylium chloride, 1807[1].
$C_{21}H_{15}ClO_5$ Diphenylbenzopyrylium perchlorate, 3167[5]
$C_{21}H_{15}Cl_2N$ *o* - Toluidine, 1,5 - dichloro - 9 - anthryl-, 754[5].
$C_{21}H_{15}Cl_3N_2O_2$ Phthalanilide, 4 - (trichloromethyl)-, 184[7].
$C_{21}H_{15}NO$ Benzoxazole, 1 - (*α* - phenylstyryl), 2849[2].
$C_{21}H_{15}NO_2$ Anthracene, 9 - benzyl - 10 - nitro-, 3453[1].
1 - Naphthalenecarbamic acid, naphthyl esters, 2319[5].
$C_{21}H_{15}NO_3$ 1,10 - Anthracenedione, 4 - hydroxy-9-*p*-toluino-, 2853[7].
$C_{21}H_{15}NO_6$ Benzoin, 4'-nitro-, benzoate, 327[1].
Protoberberine, 2,3,9,10 - bismethylenedioxyoxy-, acetate, 3297[9].
$C_{21}H_{15}N_3$ *s*-Triazine, 2,4,6-triphenyl-, 207[9]
$C_{21}H_{15}N_3O_2$ 4(3) - Quinazolone, 3 - benzamido-2-phenyl-, 206[9].
$C_{21}H_{15}N_3O_7$ Benzotoluide, *N* - hydroxydinitro-, benzoate, 2667[1,2].
Picrate, m. 155°, of hydrocarbon from cholesterol, 1241[9].
$C_{21}H_{15}N_5O_7$ Anthranilic acid, *N* - (*m* - nitrobenzoyl), *β* - *m* - nitrobenzoylhydrazide, 206[8].
$C_{21}H_{15}N_9O_{14}$ Imidazole, 4 - (aminophenyl) dipicrate, 395[5,6].
$C_{21}H_{16}$ Anthracene, 9 benzyl-, 3452[8].
—, 9-methyl-10-phenyl-, 3003[6].
$C_{21}H_{16}Cl_2O_4$ Muconic acid, *α*, *δ* - bis(*p* - chlorophenyl) - *β* - ethoxy - *γ* - hydroxy-, lactone, Me ester, 2849[6].
—, *α*, *δ* - bis(*p* - chlorophenyl) - *β* - hydroxy-*γ* - methoxy-, lactone, Et ester, 2849[6].
$C_{21}H_{16}N_2$ Benzimidazole, 2 - (*α* - phenylstyryl)-, 2849[3].
$C_{21}H_{16}N_2O$ Coumarin, 3 - phenyl-, phenylhydrazone, 3291[4].
$C_{21}H_{16}N_2O_2$ 3 - Indazolol, 2 - *p* - tolyl-, benzoate, 2496[6].
Phthalide, 2 - anilino - 4 - (phenyliminomethyl)-, 184[6].
$C_{21}H_{16}N_2O_3$ 3 - Indazolol, 2 - *p* - anisyl-, benzoate, 2496[7].
$C_{21}H_{16}N_4$ 1,2,3 - Triazole - 4 - aldehyde, 1,5-diphenyl - 4 - (phenyliminomethyl)-, 416[9].
$C_{21}H_{16}N_4O$ 6 - Phthalazinealdehyde, 1,2 - di-

hydro - 1 - keto - 2 - phenyl-, phenylhydrazone, 184[5].
1,2,3 - Triazole - 4 - carboxanilide, 1,5-diphenyl-, 416[9].
$C_{21}H_{16}N_4OS$ Δ^2 - 1,2,4 - Triazoline - 3 - mercaptan, 1 - benzoyl - 4 - phenyl - 5 - phenylimino-, 2162[2].
$C_{21}H_{16}N_4O_4$ Anthranilic acid, *N* - *m* - nitrobenzoyl-, *β* - benzoylhydrazide, 206[9].
$C_{21}H_{16}N_4O_8$ 5 - Acridineëthanol, picrate, 1239[2].
$C_{21}H_{16}N_6O_8$ Isoindazole, 7 - benzamido - 5-methyl-, picrate, 2497[6].
$C_{21}H_{16}O_3$ Compd., m. 150°, from 2,2,4,5-tetraphenyl - 3(2) - furanone, 391[1].
$C_{21}H_{16}O_4S$ Sulfonefluoran, 3,6 - dimethyl-, 3001[3]
$C_{21}H_{16}O_5$ 2,3 - *β* - Indenopyran - 2 - carboxylic acid, 1,2,3,9 - tetrahydro - 3,9 - diketo-1-phenyl-, Et ester, 911[9]
$C_{21}H_{16}O_6$ 1,1,2 - Ethanetriol, 2 - *p* - anisyl-1,2 - bis(2,4 - dihydroxyphenyl)-, anhydride, 2324[3].
Muconic acid, *β,γ* - dihydroxy - *α,δ* - diphenyl-, *γ* - lactone, Me ester, acetate, 2849[7]
$C_{21}H_{16}O_7$ Coumarin, 5,7 - dihydroxy - 4 - (*p*-hydroxyphenyl)-, triacetate, 595[1]
$C_{21}H_{16}O_8S$ Sulfonegallein, di-Me ether, 2491[5]
$C_{21}H_{16}S_2$ Disulfide, 9 - anthryl benzyl, 747[5]
$C_{21}H_{17}BO_6$ Ketone, 1 - hydroxy - 2 - naphthyl phenyl, boroacetate, 1052[9]
$C_{21}H_{17}CuNO_2$ Benzoin, *α* - benzyl-, oxime, Cu deriv., 1055[7]
$C_{21}H_{17}IN_2$ Dye, m. above 330°, from 2,2'-methylenebisquinoline, $(CH_2Br)_2$ and KI, 2330[9].
$C_{21}H_{17}N$ Benzalimine, *α* - (9,10 - dihydro - 9 - anthryl)-, 3293[7]
$C_{21}H_{17}NO$ Ketone, 9,10 - dihydro - 9 - anthryl phenyl, oxime, 3293[1]
$C_{21}H_{17}NO_3$ Acetanilide, *p* - (*p* - hydroxyphenyl)-, benzoate, 1073[6]
9 - Anthrol, 9 - benzyl - 9,10 - dihydro-10-nitro-, 3453[7]
Benzanilide, *o'* - (hydroxymethyl)-, benzoate, 1073[5]
—, *p'* - (*p* - hydroxyphenyl)-, acetate, 1073[4]
$C_{21}H_{17}N_3O_2$ Δ^2 - Pyrazoline, 1 - (*p* - nitrophenyl)-3,5 - diphenyl-, 762[6]
$C_{21}H_{17}N_3O_3$ Anthranilic acid, *N* - benzoyl-, *β*-benzoylhydrazide, 206[8].
Benzoic acid, *p* - benzamido-, benzoylhydrazide, 1066[6].
$C_{21}H_{17}N_3S$ 1,4,3 - Isothiodiazine, 2 - (1 - naphthylamino) - 5 - phenyl-, Ac deriv., 416[4].
$C_{21}H_{17}N_5$ Imidazophenazine, 2 - (*p* - dimethylaminophenyl)-, 1805[7].
$C_{21}H_{17}N_5O_7$ Acridine, 5 - (*β* - aminoethyl)-, picrate, 2501[7]
$C_{21}H_{18}AsN_3O_7$ Arsanilic acid, *N* - 3 - (*m* - nitrobenzamido) - *p* - anisoyl-, 394[5]
$C_{21}H_{18}BiCl_2N_3O_6$ Bismuthine, tris(nitrotolyl)-, dichloride, 1063[8], 1984[7].
$C_{21}H_{18}BiN_3O_6$ Bismuthine, tris(nitro-*p*-tolyl)-, 1063[8], 1984[7].
$C_{21}H_{18}BiN_5O_{12}$ Bismuthine, tris(nitro - *p*-tolyl)-, dinitrate, 1063[8], 1984[7].
$C_{21}H_{18}N_2O_3$ Benzaldehyde, *o* - methoxy-, oxime, diphenylcarbamate, 179[8].
Benzanilide, *o'* - hydroxy - *N* - methyl-, carbanilate, 1090[1].
$C_{21}H_{18}N_2O_4$ 1 - Isobenzofurancarboxylic acid, 1 - anilino - 1,2 - dihydro - 2 - keto-(?), $PhNH_2$ deriv., 1614[1].
$C_{21}H_{18}N_4O$ Pyrazole, 1,1' - carbonylbis[3(and 5) - methyl - 5(and 3) - phenyl-, 2856[7].
$C_{21}H_{18}N_4O_6$ Benzophenone, 2,4 - dimethoxy-, 2,4 - dinitrophenylhydrazone, 2848[8].
$C_{21}H_{18}N_4O_8S$ Benzoic acid, *p* - dimethylaminothiol-, Ph ester, picrate, 371[4].
$C_{21}H_{18}N_4O_9$ Benzoic acid, *p* - dimethylamino-, Ph ester, picrate, 371[4].
$C_{21}H_{18}N_4S$ 1,3,4 - Triazole, 2 - anilino - 5 - (benzylmercapto) - 1 - phenyl-, 2162[2].
$C_{21}H_{18}O$ 9 - Anthrol, 10 - benzyl - 9,10 - dihydro-, 3452[8].
Propiophenone, *α,β*-diphenyl-, 2325[1].
$C_{21}H_{18}O_2$ 1 - Acrylonaphthone, 2 - ethoxy - *β* - phenyl-, 1617[5]
9 - Anthrol, 1,2,3,4 - tetrahydro-, benzoate, 1404[1]
Hydrocinnamic acid, *β,β* diphenyl-, 2010[8].
Xanthydrol, 9 - phenethyl-, *perchlorate*, 2328[5].
$C_{21}H_{18}O_2S$ Acetic acid, diphenyl - *p* - tolylmercapto-, 375[6]
$C_{21}H_{18}O_3$ Lactic acid, *α,β,β* - triphenyl-, 594[3], 2844[9]
$C_{21}H_{18}O_4$ 1,3 - Indandione, 2 - *α* - (diacetylmethyl)benzyl-, 912[1]
$C_{21}H_{18}O_4S$ 9 - Xanthene - *α* - benzenesulfonic acid, 3,6 - dimethyl-, *Zn salt*, 3001[4]
$C_{21}H_{18}O_5$ Muconic acid, *β,γ* - dihydroxy - *α,δ* - di - *p* - tolyl-, monolactone, Me ester, 2849[6]
$C_{21}H_{18}O_5S$ *m* - Cresolsulfonephthalein, *and salts*, 3001[2,3]
$C_{21}H_{18}O_6$ Chromone, 3 - benzyldihydroxy - 2 - methyl-, diacetate, 197[1,2]
Malonic acid, (*α* - 1,3 - diketo - 2 - indanyl-benzyl)-, mono Et ester, 911[9]
$C_{21}H_{18}O_7$ Chrysin, 3,2' - dimethoxy-, diacetate, 195[9]
$C_{21}H_{19}AuCl_4N_2O_2$ 1 - [*β* - (1,3 - Dihydro - 1 - hydroxy - 3 - keto - 1 - phenyl - 2 - isoindyl)ethyl]pyridinium chloroaurate, 1408[2]
$C_{21}H_{19}BrN_2O_2$ 1 - [*β* - (1,3 - Dihydro - 1 - hydroxy - 3 - keto - 1 - phenyl - 2 - isoindyl)ethyl]pyridinium bromide, 1408[2]
$C_{21}H_{19}NO$ Benzamide, *N,N* - di - *p* - tolyl-, 181[9]
Benzimidic acid, *N* - *p* - tolyl-, *p* - tolyl ester, 181[8]
$C_{21}H_{19}NO_2$ Benzamide, *N* - *p* - phenoxymethylbenzyl-, 891[8]
$C_{21}H_{19}NO_3$ Eugenol, 1 - naphthalenecarbamate, 2319[8].
Isoeugenol, 1 - naphthalenecarbamate, 2319[8]
$C_{21}H_{19}NO_4$ Isobutyric acid, *β,β'* - dibenzoyl-*α* - cyano-, Et ester, 404[8]
$C_{21}H_{19}NS_2$ Thiobenzaldine, 1220[1]
$C_{21}H_{19}N_3$ Acenaphthotriazole, 4,5 - dihydro-8 - (pseudocumyl)-, 1081[4]
$C_{21}H_{19}N_3O_2$ Lutidinedicarboxanilide, 1226[8].
$C_{21}H_{19}N_3O_4$ Toluidine, dibenzyldinitro-, 3448[8].
$C_{21}H_{19}N_5O$ Benzaldehyde, *m*(and *p*) - [*p* - (*p* - dimethylaminophenylazo)phenylazo]-, 2836[8].
$C_{21}H_{19}N_5O_7$ Trimethyl[*p* - (*p* - nitrophenyl)-phenyl]ammonium picrate, 586[8]
$C_{21}H_{19}N_5O_9S$ *p* - Toluenesulfono - *p* - phenetide, 3' - anilino - 3,2',6' - trinitro-, 400[8].
$C_{21}H_{20}AsN_3O_6$ Arsanilic acid, *N* - [3 - (*m* - aminobenzamido) - *p* - anisoyl]-, *and salts*, 394[5]

$C_{21}H_{20}ClNO_6$ Propionic acid, (chlorobenzoyl)-hydroxyphenyl-, methyl ester, oxime, di acetate, 3168[6]

$C_{21}H_{20}Cl_2N_2O_4$ Acetoacetanilide 1,4′ - methyl enebis[2-chloro , P 1910[6].

$C_{21}H_{20}N_2$ Acetamidine, N,N - diphenyl - N' (p - tolyl)-, 1799[4].

Benzidine, N' - benzal - N,N - dimethyl , 587[1].

$C_{21}H_{20}N_2O_3S$ Acetophenone, α - (p - anisylsulfonyl) , phenylhydrazone, 419[9].

$C_{21}H_{20}N_2O_5$ Acetoacetanilide, p,p' - carbonylbis , P 1910[7].

$C_{21}H_{20}N_4O_4$ 5 - m - Tolylenediamine, 4,6 dinitro N,N' di - p - tolyl , 1223[1]

$C_{21}H_{20}N_4O_7$ Trimethyl(p - phenylphenyl)ammonium picrate, 586[8].

$C_{21}H_{20}N_4O_5S$ p - Toluenesulfono p phenetide, 2′ amino 3,4′ dinitro , 100[8]

$C_{21}H_{20}O$ Propanol, triphenyl , 1798[6], 2850[1,2]

$C_{21}H_{20}O_2$ 2,2′ Spirobibenzosuberan - 1,1′-dione, 911[2].

$C_{21}H_{20}O_3S$ Sulfide, p,p' dimethoxybenzohydryl phenyl, 375[3]

$C_{21}H_{20}O_5$ Chromone, 2 (3,4 - dimethoxystyryl) 5 hydroxy 3,7 dimethoxy , 196[1]

$C_{21}H_{20}O_6$ Coumarin, 4 (3,4 dimethoxyphenyl) 3 hydroxy 5,7 dimethoxy , acetate, 2489[1]

$C_{21}H_{20}O_9$ Chrysophanic acid, glucoside, 2679[1]

$C_{21}H_{20}O_9S_3$ Glycerol, tribenzenesulfonate, 740[1]

$C_{21}H_{20}O_{10}$ Emodin, glucoside, 2679

$C_{21}H_{20}O_{12}$ · $3H_2O$ Quercetin, glucoside, 2519[1]

$C_{21}H_{21}BiBr_2$ Bismuthine, tritolyl , dibromide, 1063[6], 1984[6]

$C_{21}H_{21}BiCl_2$ Bismuthine tritolyl , dichloride, 1063[6], 1984[5]

$C_{21}H_{21}BiN_2O_6$ Bismuthine, t p tolyl , di nitrate, 1984[6]

$C_{21}H_{21}BiO_3$ Bismuthine, tri anisyl , 1063

$C_{21}H_{21}HgI_3N_2$ Quinoline, complex salt with PrI and HgI_2, 4695[8]

$C_{21}H_{21}N$ Dibenzylamine, N - tolyl , 2155[9], 2156[1].

Tribenzylamine, 1223[2]

$C_{21}H_{21}NO_2$ Carvacrol, 1 naphthalenecarbamate, 2319[8].

Cinchophen, 6 methyl , Bu ester, salts, P 424[7].

Thymol, 1 - naphthalenecarbamate, 2319[8]

$C_{21}H_{21}NO_4$ Palmatine, 1085[8]

$C_{21}H_{21}NO_5$ (See also *Hydrastine*)

Δ^2 5,5 - Isoxazolinedicarboxylic acid, 3,4 diphenyl , N - oxide, di Et ester, 2327

$C_{21}H_{21}N_3$ 3 - Acenaphthenamine, 2 (ψ - pseudo cumylazo , 1081[4]

$C_{21}H_{21}N_3O_7$ Chamazulene, picrate, 1227[1]

Eucazulene, picrate, 1227[2]

Guaiazulene, picrate, 1227[6]

$C_{21}H_{21}N_3O_8$ Chamazulene, styphnate, 1227

Eucazulene, styphnate, 1227[1].

Guaiazulene, styphnate, 1227[2]

$C_{21}H_{21}N_5O_7$ Indazole, 2 benzyl 4,5,6,7 - tetrahydro - 5 - methyl , picrate, 389[8]

$C_{21}H_{21}O_4P$ p - Tolyl phosphate, 1605[2]

$C_{21}H_{22}BrNO_6$ Malonic acid, bromo β - nitro α,β - diphenylethyl) , di Et ester, 2327[2]

$C_{21}H_{22}Br_2O_{10}$ Phlorhizin, dibromo , 422[9], 1277[1].

$C_{21}H_{22}INO_2$ α - Anisal - 1 - ethyl 1,4 - dihydro - 4 - keto - 1 - methylquinaldinium iodide, 1026[3].

α - Anisal - 1 - ethyl - 4 - methoxyquinaldinium iodide, 1026[2].

$C_{21}H_{22}N_2O_2$ See *Strychnine.*

$C_{21}H_{22}N_2O_2S$ Thiochromone, 3 - (p - dimethylamino - N - propionylanilino) - 6 - methyl-203[7].

$C_{21}H_{22}N_2O_3$ Carbamic acid, [β - (6 - methoxy - 2-phenyl - 4 - quinolyl)ethyl]-, Et ester, 1413[6].

2 - Pyrazinecarboxylic acid, 1,2,3,6 - tetrahydro - 6 - keto - 3,3 - dimethyl - 2,5-diphenyl-(?), Et ester, 2152[9].

Strychnine, N-oxide, 1114[8]

$C_{21}H_{22}N_2O_4$ 1 - Isoquinolineacetonitrile, 1,2,3,4-tetrahydro 5,6 - dimethoxy - 2 - methyl-α - (3,4 - methylenedioxyphenyl)-, 2330[8].

$C_{21}H_{22}N_2O_6$ Carbanilic acid, malonylbis-, diethyl ester, 3164[5].

$C_{21}H_{22}N_4O_4$ Carbanilide, p,p bis(acetoacetamido)-, P 1910[7].

$C_{21}H_{22}N_4O_8$ 2,7 - Fluorenedibicarbamic acid, tetra Me ester, 410[6].

$C_{21}H_{22}N_4O_9$ 3,4 - Pyrazoledicarboxylic acid, 1-(α,γ - dicarbethoxyacetonylazophenyl)-5 methyl-, 599[1].

$C_{21}H_{22}O_3$ Anthrol, octahydro-, benzoate, 1404[2], 1405[3]

β Truxinic acid, monoisopropyl ester, 2664[8]

$C_{21}H_{22}O_9$ Chalcone, 4′ - hydroxy-, glucoside, 593[2]

$C_{21}H_{22}O_8$ Flavone, 3,5,7,3′,4′,5′ - hexamethoxy-, 1991[1]

$C_{21}H_{22}O_{12}$ Quercitrin, 1991[1]

$C_{21}H_{23}IN_2$ α - (p - Dimethylaminobenzal) - 1-ethylquinaldinium iodide, 419[6]

$C_{21}H_{23}NO$ Lepidine, 6 - isoamoxy - 2 - phenyl-, 418[7].

$C_{21}H_{23}NO_3$ 3 - Dibenzofuranol, 1,2,3,4,4a,9b-hexahydro - 6,9b - dimethyl (?), carbanilate, 100[7].

$C_{21}H_{23}NO_4$ See *Meconidin*

$C_{21}H_{23}NO_5$ (See also *Cryptopine; Hevoine*)

Anhydrodihydrocryptopine oxide, and -HCl, 3297[5]

Anhydrotetrahydromethylberberine, and oxide HCl, 1629[5]

$C_{21}H_{23}NO_6$ 5,5 - Isoxazolidinedicarboxylic acid, 2 hydroxy - 3,4 - diphenyl , di-Et ester, 2327[4].

Malonic acid, (β - nitro - α,β - diphenyl ethyl) , di-Et ester, 2327[1]

$C_{21}H_{23}NO$ Homophthal 1 - amic acid, 3,4 methylenedioxy - N - veratrylmethyl , Me ester, 3297[7]

$C_{21}H_{23}N_3$ Aniline, N,N - dimethyl p,p',p''-methenyltris , 2836[1]

$C_{21}H_{23}N_3O_8$ Anhydrocotarnine - 2,6 - dinitrohomoveratrole, 3449[6]

$C_{21}H_{24}ClNO_4$ Paraberine, 7,12,12a,13 - tetrahydro 2,3 - dimethoxy 9,10 - methylenedioxy , methochloride, 1084[3].

$C_{21}H_{24}INO_3$ Norcodeine, N - propargyl-, methiodide, 3012[6]

$C_{21}H_{24}INO_4$ Dicentrine, methiodide, 206[2].

N Methylpapaverinium iodide, 1795[7].

Paraberine, 7,12,12a,13 - tetrahydro - 2,3-dimethoxy 9,10 - methylenedioxy-, methiodide, 1084[3]

$C_{21}H_{24}N_2O_4$ Lysuric acid, Me ester, 2983[2].

Ornithuric acid, Et ester, 2983[2].

$C_{21}H_{24}O_4$ Malonic acid, bis(γ - phenylpropyl)-, 911[3]

$\Delta^{1,4}$ - 1 - Pentadienone, 1,5 - di - p - anisyl-, dimethyl acetal, 403[4].

Phenolglutarein, 4,4 - diethyl-, 2676[8].

$C_{21}H_{24}O_7$ Pseudocatechol, acetyltetramethyl-, 3007[8].

$C_{21}H_{24}O_{10}$ + $2H_2O$ See *Phlorhizin*.

$C_{21}H_{24}Sn_2$ Distannane, 1 - trimethyl - 2 - triphenyl-, 2977[5].

$C_{21}H_{25}BrN_2O_4$ 2,6 - Lutidine - 3,5 - dicarboxylic acid, 4 - (3 - bromo - 4 - dimethylaminophenyl)-, di-Et ester, 1081[9].

$C_{21}H_{25}NO_2$ Borneol, 1 - naphthalenecarbamate, 1232[9].

Isoborneol, 1 - naphthalenecarbamate, 1232[9].

$C_{21}H_{25}NO_3$ Norcodeine, *N* - (cyclopropylmethyl)- *and salts*, 3012[6,7].

$C_{21}H_{25}NO_4$ Boldine, di-Me ether, 1628[4]; *and -HI*, 1406[1].

Corybulbine, 765[2].

Glaucine, 1628[4].

Isocorybulbine, 765[2].

Palmitine, tetrahydro-, 3295[5]; *and salts*, 603[9], 604[2,3].

$C_{21}H_{25}N_3O$ Acetaldehyde, cyclohexyldiphenyl-, semicarbazone, 1989[1].

$C_{21}H_{25}N_3O_6$ 2,6 - Lutidine - 3,5 - dicarboxylic acid, 4 - (4 - dimethylamino - 3 - nitrophenyl)-, di-Et ester, 1081[9].

$C_{21}H_{26}INO_4$ Neopine, acetyl-, methiodide, 2332[2].

$C_{21}H_{26}N_2O_2$ 1 - Propanone, 3 - (3 - ethylidene-1 - methyl - 4 - piperidyl) - 1 - (6 - methoxy - 4 - quinolyl)-, 1993[9].

$C_{21}H_{26}N_2O_3$ See *Yohimbine*.

$C_{21}H_{26}N_2O_4$ *α* - Toluic acid, *N*, *N'* - pentamethylenebis[*α* - amino-, *Na salt*, 371[1].

—, *N*, *N'* - trimethylenebis[*α* - amino-, di-Me ester, *and di-HCl*, 370[9].

$C_{21}H_{26}N_4$ Cyclohexanealdehyde, 2 - keto - 4,6-dimethyl-, bisphenylhydrazone, 389[4].

$C_{21}H_{26}N_4O_7$ Aniline, *N* - butyl - *N* - (cyclobutylmethyl)-, picrate, 390[5].

$C_{21}H_{26}O_2$ 7 - *p* - Cymenecarboxylic acid, *p* - isopropylbenzyl ester, 2488[6].

$C_{21}H_{26}O_{10}$ Glucoside, *β* - *o* - cresyl-, tetraacetate 605[8].

$C_{21}H_{26}O_{11}$ Salicin, tetraacetate, 605[9].

$C_{21}H_{27}BrN_2O_4$ 2,6 - Lutidine - 3,5 - dicarboxylic acid, 4 - (3 - bromo - 4 - dimethylaminophenyl) - 1,4 - dihydro-, di-Et ester, 1081[9].

$C_{21}H_{27}IN_2O_2$ 2 - Quinuclidinecarbinol, 5 - ethyldene - *α* - (6 - methoxy - 4 - quinolyl)-, methiodide, 1993[8].

$C_{21}H_{27}N$ Cyclohexylamine, 2 - benzyl - *N*-phenethyl-, *and salts*, 2665[7,8,9].

$C_{21}H_{27}NO_2$ Menthol, 1 - naphthalenecarbamate, 1232[9].

$C_{21}H_{27}NO_6S$ 5,6,6₁,7 - Tetrahydro - 9,10 - dimethoxy - 6,6 - dimethyl - 6,4 - *peri*-naphthoquinolinium methosulfate, 3458[8].

$C_{21}H_{27}N_3O$ 2 - Octanone, 1,1 - diphenyl-, semicarbazone, 1786[9].

$C_{21}H_{27}N_3O_6$ 2,6 - Lutidine - 3,5 - dicarboxylic acid, 4 - (4 - dimethylamino - 3 - nitrophenyl) - 1,4 - dihydro-, di-Et ester, 1081[9].

$C_{21}H_{27}N_9O_{14}$ Piperidine, 1 - {*β* - [(*β* - aminoethyl)amino]ethyl}-, dipicrate, 2862[7].

$C_{21}H_{28}N_2O_2$ (See also *Optochine*.)

Isopyrrole, 5 - ethyl - 2 - (5 - ethyl - 3 - methyl - 4 - propionyl - 2 - pyrrylmethylene) - 3 - methyl - 4 - propionyl-, *and -HCl*, 1236[3,4].

Isovaleramidine, *N*, *N'* - di - *p* - phenetyl-, 1218[5].

Valeramidine, *N*, *N'* - di - *p* - phenetyl-, 1218[4].

$C_{21}H_{28}N_2O_6$ 2,4 - Pyrroledicarboxylic acid, 5-[(5 - carboxy - 2,4 - dimethyl - 3 - pyrryl)-methyl] - 3 - methyl-, tri-Et ester, 2159[7].

$C_{21}H_{28}N_4O_4$ *d* - [1,3] - Glucose, 4,5,6 - trimethyl-, osazone, 170[9].

$C_{21}H_{28}O_3$ Δ^2 - 1 - Propenone, 3 - hydroxy - 1-(1,2,2,3 - tetramethylcyclopentyl)-, hydrocinnamate, 1399[8].

$C_{21}H_{29}IN_2O_2$ Niquine, *N* - methyl-, methiodide, 1994[1].

$C_{21}H_{29}N_5O_7$ Pyridine, 2 - diisoamylamino-, picrate, 3009[1].

$C_{21}H_{30}INO_6$ 5 - Desoxymorphinic acid, dihydro-, Me ester, acetate, methiodide, 2165[6].

$C_{21}H_{30}N_2O$ Urea, *α*,*α* - diisoamyl - *β* - 1 - naphthyl , 2319[5].

$C_{21}H_{30}N_2O_2$ Pyrrole, 2,2' - methylenebis[5-ethyl - 3 - methyl - 4 - propionyl-, 1236[3].

$C_{21}H_{30}N_2O_4$ 2 - Pyrrolecarboxylic acid, 5,5'-methylenebis[4 - ethyl - 3 - methyl-, di-Et ester, 2159[9].

$C_{21}H_{30}N_4O_4$ Galactose, methyl[*p* - (*p* - *α* - methylhydrazinobenzyl)phenyl]hydrazone, 904[7].

Mannose, methyl[*p* - (*p* - *α* - methylhydrazinobenzyl)phenyl]hydrazone, 904[8].

$C_{21}H_{30}O_5$ Lupulic acid, 744[4].

$C_{21}H_{30}O_9$ Acid from oxydigitogenic acid, m. 215–6°, 1414[4].

$C_{21}H_{31}NO_4$ Undecylenamide, *N* - vanillyl , acetate, 405[1].

$C_{21}H_{31}NO_5$ Taxinolamine, 767[9].

$C_{21}H_{31}NO_{11}$ Acid from oxydigitogenic acid, 1414[4]

$C_{21}H_{32}N_4O_4$ Benzene, 2,4 - dinitro 1,3,5 - tri-1 - piperidyl , 1222[7].

$C_{21}H_{33}NO_4$ Tridecoic acid, *μ* - hydroxy-, Me ester, carbanilate, 1599[1].

$C_{21}H_{33}NO_6$ Delcosine, 1493[9].

$C_{21}H_{34}O_3$ Cyclopentanecarbinol, 1,2,2,3 - tetramethyl-, camphocarboxylate, 1399[7].

$C_{21}H_{35}NO_2$ Abietic acid, $MeNH_2$ salt, 2165[9].

$C_{21}H_{36}N_2O_6$ Camphonamic acid, ureidobis , dimethyl ester, 3165[7].

$C_{21}H_{36}O_2$ Urushiol, 3241[9].

$C_{21}H_{36}O_4$ Malonic acid, chaulmoogryl-, 3160[9].

$C_{21}H_{38}O_4$ 1,3,3a - Cyclopentadioxole - 4 - tridecoic acid, 4,5,6,6₁ - tetrahydro - 2,2 dimethyl , 2315[3,4].

$C_{21}H_{40}Cl_2O_2$ Stearic acid, 1,3 - dichloropropyl ester, 2818[4].

$C_{21}H_{40}O_2$ 2,4 - Heneicosanedione, 739[1].

$C_{21}H_{40}O_3$ Stearic acid, 2,3 - epoxypropyl ester, 2658[8], 2659[1].

$C_{21}H_{40}O_4$ 1,17 - Heptadecanedicarboxylic acid, di-Me ester, 1789[3].

$C_{21}H_{42}N_2O_4$ Caprylic acid, *N*, *N'* - trimethylenebis[*α* - amino-, di-Me ester, 370[8].

$C_{21}H_{42}O_2$ Heneicosoic acid, 738[3].

Stearic acid, Pr ester, 2818[8].

Palmitic acid, Am and isoamyl esters, 2818[9].

$C_{21}H_{42}O_4$ Stearin, *α*-mono-, 2658[8], 2659[1].

$C_{22}H_6Br_4O_4$ 5,7,12,14 - *ββ* - Dibenzanthracenetetrone, tetrabromo-, 386[1].

$C_{22}H_8Br_2Cl_4O_5$ Fluoran, 2,4 - dibromo - 12,13,-14,15 - tetrachloro - 3 - hydroxy-, acetate, 3001[4].

$C_{22}H_8Br_4N_4O_3$ 6(4),9' - Spiro[2,1,3,5 - furotriazolexanthene] - 4 - one, 3',6' - dihydroxy - 2 - phenyl-, tetrabromo deriv., 1410[8].

$C_{22}H_{10}Br_4O_6$ Terephthalic acid, 2,5 - bis(dibromo - 4 - hydroxybenzoyl)-, 386[1].

$C_{22}H_{10}Cl_4O_5$ Fluoran, 12,13,14,15 - tetrachloro-3 - hydroxy-, acetate, 3001[6].
$C_{22}H_{12}Cl_4Na_2O_4$ Phthalide, 3,4,5,6 - tetrachloro-2 - (2,3 - cresyl) - 2 - (4,3 - cresyl)-, di-Na deriv., 1231[6].
$C_{22}H_{12}Cl_4OS_2$ 1 - Naphthol, 2,4 - bis(2,5 - dichlorophenylmercapto)-, 3289[7].
$C_{22}H_{12}Cl_4O_5$ 9 - Xanthene - *o* - benzoic acid, 3′,4′,5′,6′ - tetrachloro - 3 - hydroxy-, acetate, 3001[7].
$C_{22}H_{12}Cl_6O_6$ Hydroquinol, 2,6 - bis(2,4,6 - trichlorophenoxy)-, diacetate, 2319[1].
$C_{22}H_{13}NO_2$ γγ′ - Dibenzacridine - 14 - carboxylic acid, 598[1].
$C_{22}H_{13}N_3O_5$ 6(4),9′ - Spiro[2,1,3,5 - furotriazole-xanthene] - 4 - one, 3′,6′ - dihydroxy-2 phenyl-, 1410[2].
$C_{22}H_{13}N_5$ 1 - Benzotriazolophenazine, 1 - phenyl-, 2859[3].
$C_{22}H_{13}N_7O_5$ 4 (or 5) - αβ - Naphthotriazolol, 7-nitro - 2 - (*p* - nitrophenyl) - 5 (or 4)-phenylazo-, 2859[9].
$C_{22}H_{14}Cl_2N_2O_2S$ 4 - Thiazolidone, 5 - (3,5 - dichlorosalicylal) - 3 - phenyl - 2 - phenylimino-, 1980[7].
$C_{22}H_{14}Cl_2OS_2$ 1 - Naphthol, 2,4 - bis(*p* - chlorophenylmercapto) , 3289[7]
$C_{22}H_{14}Cl_2O_2$ 9 - Anthrol, 1,5 - dichloro - 10-phenyl , acetate, 2677[9].
$C_{22}H_{14}Cl_2O_3$ Anthrone, 1,5 dichloro - 10 - hydroxy 10 - phenyl , acetate, 2678[1].
$C_{22}H_{14}Cl_4O_4$ Phthalide, 2 - *o* - anisyl - 2 - *p* anisyl - 3,4,5,6 - tetrachloro , 596[7].
$C_{22}H_{14}N_2O_4$ 2,4(1,3) - Quinazolinedione, di-Bz deriv., 382[1].
$C_{22}H_{14}N_4O_2$ Terephthalic acid, 2,5 - diformyl-, bisphenylhydrazone, 380[3].
$C_{22}H_{14}N_6O_{14}$ Propane, 2 - (3,4 - methylenedioxyphenyl) - 1,3 - dipicryl-, 3000[4].
$C_{22}H_{14}O_4$ 2 - Naphthol, oxalate, 47[3].
$C_{22}H_{15}BrN_4O_7$ (?) - Bromo - 1 - methyl - 2-phenylquinolinium picrate, 1082[9].
$C_{22}H_{15}BrO$ Indone, 3 - (α - bromobenzyl) - 2-phenyl-, 1804[3].
$C_{22}H_{15}Br_2NO_4S_2$ Quinaldine, α,3 - bis(*p* - bromophenylsulfonyl) , 1625[9].
$C_{22}H_{15}ClO_3$ 9 - (3,4 - Methylenedioxystyryl)-xanthylium chloride, *$ZnCl_2$ salt*, 1807[1].
$C_{22}H_{15}ClO_4$ Methane, benzoyl(5 - chloro - 2-hydroxybenzoyl)-, benzoate, 1238[1].
$C_{22}H_{15}ClO_5$ 3,6 - Dihydroxy - 9 - (3,4 - methylenedioxystyryl)xanthylium chloride, 1807[2].
$C_{22}H_{15}Cl_2NO_4$ 9 - Anthrol, 1,5 - dichloro - 9,10-dihydro - 10 - nitro - 9 - phenyl-, acetate, 2678[4].
$C_{22}H_{15}Cl_3O_3Zn + H_2O$ 9 - (3,4 - Methylenedioxystyryl)xanthylium chloride, $ZnCl_2$ salt, 1807[1].
$C_{22}H_{15}N_3$ Rosinduline, 742[4].
$C_{22}H_{15}N_3O_3S$ 4 - Thiazolidone, 5 - (*o* - nitrophenyl) - 3 - phenyl - 2 - phenylimino , 1980[7].
…$_{15}N_3O_{11}$ 7 - Hydroxy - 2 - (*p* - hydroxyphenyl) - 3 - methoxybenzopyrylium picrate, 3297[4].
$C_{22}H_{15}N_5O$ 4 (or 5) - βα - Isonaphthotriazolol, 3 - phenyl - 5 (or 4) - phenylazo-, 2859[8].
$C_{22}H_{16}ClN_3O_4$ 12 - (*p* - Aminophenyl) - 12 - α benzophenazonium perchlorate, 602[7].
$C_{22}H_{16}Cl_2O$ Ether, 1,5 - dichloro - 10 - phenyl-9-anthryl ethyl, 2678[5].
$C_{22}H_{16}Cl_4O_2S_2$ α - Toluic acid, α,α - bis(2,5-dichlorophenylmercapto)-, Et ester, 3289[4].
$C_{22}H_{16}N_2$ Quinoline, 4 - benzalamino - 2 - phenyl-, 3011[1].
$C_{22}H_{16}N_2O$ Cinchoninanilide, 2 - phenyl-, 2857[4].
2(1) - Naphthalenone, 4 - anilino - 1 - phenylimino-, 191[2].
1,4 - Naphthoquinonimine, 2 - anilino - *N*-phenyl-, 2308[3].
Quinoline, 4 - benzamido - 2 - phenyl-, 3011[1].
$C_{22}H_{16}N_2OS$ 4 - Thiazolidone, 5 - benzal - 3-phenyl - 2 - phenylimino-, 1980[6].
$C_{22}H_{16}N_2O_2$ Terephthalic acid, 2,5 - bis(anilinomethyl)-, di γ-lactam, 380[3].
$C_{22}H_{16}N_2O_2S$ 4 - Thiazolidone, 3 - phenyl - 2-phenylimino - 5 - salicylal-, 1980[7].
$C_{22}H_{16}N_2O_2S_4$ 2 - Thiophenecarboxanilide, *o,o′*-dithiobis-, 600[3].
$C_{22}H_{16}N_2O_3$ Naphthalamic acid, *N* - (1 - amino-2 - naphthyl)-, *and Ag salt*, 1075[6].
$C_{22}H_{16}N_2O_3S$ 4 - Thiazolidone, 5 - (3,4 - dihydroxybenzal) - 3 - phenyl - 2 - phenylimino-, 1980[8].
$C_{22}H_{16}N_2O_4S$ Naphthalenesulfonic acid, anilinodihydroketo(phenylimino)-, 2308[4].
$C_{22}H_{16}N_2O_4S_2$ 2 - Furancarboxanilide, *o,o′*-dithiobis , 600[2].
$C_{22}H_{16}N_2O_5$ Carbamic acid, dibenzoyl-, oxime, Bz deriv., 2822[7].
Glyoxylohydroxamic acid, phenyl-, oxime, di-Bz deriv., 2822[6].
$C_{22}H_{16}N_4O_2$ 1 - Naphthylamine, 4 - (*p* - nitrophenylazo) - 8 - phenyl-, 1401[6].
$C_{22}H_{16}N_4O_3$ 1,2,4 - Oxdiazole, 3 (or 5) - benzamido - 5 (or 3) - *N* - phenylbenzamido-, 2161[7].
$C_{22}H_{16}N_4O_3S$ Benzenesulfonic acid, *p* - (2-phenylazo - 1 - naphthylazo)-, *Na salt*, 195[6].
2(3) - Isonaphthotetrazine - *p* - benzenesulfonic acid, 3 - phenyl-, *Na salt*, 195[8].
$C_{22}H_{16}N_4O_8$ Quinolinol, 4 - methyl - 2 - phenyl-, picrate, 418[6,7].
$C_{22}H_{16}N_6O_{12}$ Propane, 1,3 - dipicryl - 2 - *p*-tolyl-, 3000[4].
$C_{22}H_{16}N_{10}O_{16}$ 4 (or 5) - Imidazolecarboxanilide, 2′ - amino-, dipicrate, 395[2].
$C_{22}H_{16}O$ 1 - Indanone, 3 - benzal - 2 - phenyl-, 1804[3].
Indone, 3-benzyl-2-phenyl-(?), 1804[2].
—, 2-phenyl-3-*o*-tolyl-, 1407[5].
Phthalan, 1,2 - dibenzal-(?), 1804[2].
$C_{22}H_{16}O_2$ Chromone, 6 - methyl - 2,3 - diphenyl-, 1237[8].
Compd. from 3 - benzyl - 2 - phenylindone(?), m. 138–40°, 1804[4].
Coumarin, methyldiphenyl-, 3167[9].
$C_{22}H_{16}O_3$ Compd. from 3 - benzyl - 2 - phenylindone(?), m. 112–4°, 1804[4].
Flavone, 3-benzyl-7-hydroxy-, 197[1].
$C_{22}H_{16}O_4$ Chrysin, 3-benzyl-, 197[1].
Flavone, 3-benzyl-7,8-dihydroxy-, 197[3].
Umbelliferone, 4 - *p* - anisyl - 3 - phenyl-, 595[4].
$C_{22}H_{16}O_5$ 1,2-Phthalandiol, dibenzoate, 3164[2].
$C_{22}H_{16}O_6$ Phloroacetophenone, dibenzoate, 375[9].
$C_{22}H_{17}AsN_2O_9$ Phthalamic acid, *N,N′* - (4-arsono - *o* - phenylene)bis-, 1605[9].
$C_{22}H_{17}BO_{11}$ Anthragallol, 2,3 - diacetate, boroacetate, 1052[7].
$C_{22}H_{17}Br_2N$ Dimethylamine, α,α′ - bis(5 - bromo-1-naphthyl)-, *and salts*, 1216[4].
$C_{22}H_{17}Br_2NO_3$ Acetanilide, *N* - (3,5 - dibromo-2 - hydroxybenzyl)-, benzoate, 1073[4].
$C_{22}H_{17}ClN_4$ 5 - Amino - 12 - (*m* - aminophenyl)-

12 - α - benzophenazonium chloride, 602[5].
$C_{22}H_{17}ClN_4O_4$ 5 - Amino - 12 - (*m* - aminophenyl)- 12 - α - benzophenazonium perchlorate, 602[5].
$C_{22}H_{17}ClO_2$ 9 - (*p* - Methoxystyryl)xanthylium chloride, *and FeCl₃ addn. compd.*, 1807[1].
$C_{22}H_{17}ClO_4$ 3,6 - Dihydroxy - 9 - (*p* - methoxystyryl)xanthylium chloride, 1807[2].
9 - (*p* - Hydroxystyryl)xanthylium chloride, HCO_2H addn. compd., 1807[1].
$C_{22}H_{17}ClO_5$ 3,6 - Dihydroxy - 9 - (4 - hydroxy- 3 - methoxystyryl)xanthylium chloride, 1807[2].
Methyldiphenylbenzopyrylium perchlorate, 3167[8].
$C_{22}H_{17}ClO_6$ 7 - Methoxy - 2,4 - diphenylbenzopyrylium perchlorate, 2499[1].
$C_{22}H_{17}Cl_2N$ Aniline, *p* - (4,5 - dichloro - 9 - anthryl) - *N*, *N* - dimethyl-, 2492[8].
$C_{22}H_{17}Cl_2NO_3$ Ether, 1,5 - dichloro - 9,10 - dihydro - 10 - nitro - 9 - phenyl - 9 - anthryl ethyl, 2678[6].
$C_{22}H_{17}Cl_4FeO_2$ 9 - (*p* - Methoxystyryl)xanthylium ferrichloride, 1807[1].
$C_{22}H_{17}N$ 5,11 - Indenoquinoline, 10,10 - dihydro - 10 - phenyl , 191[9].
$C_{22}H_{17}NO_2$ 5 - Acridineethanol, benzoate, 1239[2]
Benzanilide, *p* - (β - benzoylvinyl)-, *salts*, 2156[8].
$C_{22}H_{17}NO_3$ 1,2,4 - Butanetrione, 1,3,4 - triphenyl-, 4 - oxime, 390[8].
Ketone, 4,5 - dihydro - 3,4 - diphenyl - 5- isoxazolyl phenyl, *N* oxide, 390[9]
$C_{22}H_{17}NO_3S$ Quinoline, 3 - (anisylsulfonyl)- 2 phenyl , and salts, 419[9]
$C_{22}H_{17}NO_6S_2$ Acetic acid, (4 - nitro - *m* - phenylenedithio)bis-, di-Ph ester, 1993[5]
$C_{22}H_{17}N_3O$ Cinchophen, phenylhydrazide, 2857[4]
$C_{22}H_{17}N_3OS$ 2(3) - Thiazolone, 3,4 - diphenyl , benzalhydrazone, 416[3]
Δ[2] - 1,3,4 - Thiodiazoline, 3 benzoyl - 5- phenyl - 2 - *p* tolylimino , 2161[9]
1,3,4 - Triazole, 1 - benzoyl 2 (benzyl mercapto) - 5 - phenyl-, 2161[9]
1,2,4 - Triazol - 5(4) - one, 1 benzoyl 3- phenyl - 5 - thio - 4 *p* - tolyl , 2161[9]
$C_{22}H_{17}N_3O_2$ 1,2,4 Triazol - 5(4) - one, 1 - benzoyl - 3 - phenyl - 4 - *p* - tolyl , 2161[9].
$C_{22}H_{17}N_3O_7$ Anthracene, dimethyl , picrate, 2853[9], 3003[6].
$C_{22}H_{17}N_4NaO_7$ Quinoline, 1,4 dihydro 1 methyl - 2 - phenyl , Na picrate, 1082[7]
$C_{22}H_{17}N_5O_3$ 5 - Amino - 12 - (*m* - aminophenyl) 12 - α - benzophenazonium nitrate, 602[5].
$C_{22}H_{17}N_5O_7$ Pyrazole, methyldiphenyl , picrate, 2494[3].
$C_{22}H_{18}BrNOS$ Thiochromone, 3 - (α - bromobenzyl) 6 methyl , pyridine salt, 203[7].
$C_{22}H_{18}ClN_2$ 4,4′ Bipyridinium, 1,1′ diphenyl , subchloride, 2163[9].
$C_{22}H_{18}Cl_2O_2$ Anthracene, 1,5 - dichloro - 9,10- dihydro - 9,10 - dimethoxy 9 - phenyl , 2678[6].
$C_{22}H_{18}Cl_6N_2Pt$ 3 - Chloro - 1 - phenylpyridinium chloroplatinate, 741[5].
$C_{22}H_{18}N_2O$ Benzamide, *N* - (β - 5 - acridylethyl) , 2501[7].
$C_{22}H_{18}N_4O_3S$ Benzenesulfonic acid, *p* - (2 phenylhydrazino - 1 - naphthylazo)-, *Na salt, and Na HSO₃ compd.*, 195[8 A].
$C_{22}H_{18}N_4O_4$ 1 - Phthalazineacetanilide, 2,4- dihydro - 4 - hydroxy - 2 - (*p* - nitrophenyl)-, 1803[1].
$C_{22}H_{18}N_4O_6$ 1,1′ - Bi - [1,4 - pyrrolopyridine]- 3,3′ - diol, 1,1′ - diacetyl-, diacetate, 396[9].
$C_{22}H_{18}N_4O_9$ 1,3 - Propanediol, 2 - (5 - acridyl)-, picrate, 1239[2].
$C_{22}H_{18}O_2$ 1 - Indanone, 1 - benzylhydroxy - 2- phenyl-, 1804[3].
$C_{22}H_{18}O_4$ Benzoin, *p* (and *p′*) - methoxy-, benzoates, 1615[8].
Benzophenone, 4 - hydroxy - 3 - methoxymethyl-, benzoate, 402
Phenethyl alcohol, α phenyl , H phthalate, 577[5]
$C_{22}H_{18}O_6$ Addn compd , m 167°, of 2 - naphthol and oxalic acid, 47[2].
$C_{22}H_{18}O_8$ 1,1′ - Bisisobenzofuran - 1,1′(2,2′)- dicarboxylic acid, 2,2′ - diketo , di-Et ester, 1226[8].
$C_{22}H_{19}NO$ Quinoline, 1 benzoyl - 1,2,3,4 tetrahydro 2 - phenyl , 1082[8]
$C_{22}H_{19}NO_2$ Quinophthalone, 5′ - isopropyl- 8′ methyl , 1238[9]
$C_{22}H_{19}NO_3$ 3,5 Benzoxylide, 2 - hydroxy , benzoate, 2155[1]
p - Toluhydroxamic acid, α,α diphenyl , acetate, *and salts*, 591[5].
$C_{22}H_{19}NO_8S_2$ Quinophthalone, 5′ isopropyl- 8′ - methyl , disulfonic acid, *di Na salt*, 1239[1]
$C_{22}H_{19}NS_2$ α Tolunitrile, α,α bis(*p* - tolyl mercapto) , 3289[5]
$C_{22}H_{19}N_3O_3$ Semicarbazide, 1,2 - dibenzoyl 4 *p* tolyl , 2161[9].
$C_{22}H_{19}N_3S$ Benzothiazole, 1 - [α (*p* - dimethylaminophenylimino)benzyl] , 2849[7]
1,3,4 Triazole, 2 - (benzylmercapto)- 5 phenyl 1 *p* - tolyl , 2162[1].
$C_{22}H_{19}N_5O_4$ 3,4 Pyrazoledicarboxylic acid, 5 methyl 1 (α phenylcarbamylacetonylazophenyl) , 590[6].
$C_{22}H_{20}AsN_3O_9$ Arsanilic acid, *N* [3 - (4 - methoxy 3 nitrobenzamido) *p* - anisoyl] , 391[4]
$C_{22}H_{20}B_2N_2O_{10}$ Anthraquinone, 1,4 (and 1,5) diamino , diboroacetate, 1052[4]
$C_{22}H_{20}ClNO_2$ 2,8 Dimethoxy 10 benzyl acridinium chloride, P 480[3]
$C_{22}H_{20}MoN_2O_8$ + H_2O Pyridine dipyrogallol molybdate, 3405[7]
$C_{22}H_{20}N_2$ 1 Indanone, 2 benzyl , phenylhydrazone, 191[4]
$C_{22}H_{20}N_2O$ Acetophenone, α (*p* - dimethyl aminophenylimino) α phenyl , 2849[3].
$C_{22}H_{20}N_2O_2$ Carbamic acid, triphenylmethyl imino , Et ester, 408[8]
Hydrazine, α,β - dibenzoyl α (α methyl benzyl) , 1604[3]
$C_{22}H_{20}N_2O_4Zn$, 717[1].
$C_{22}H_{20}N_4O$ *o* Camphoroylene 2,3 - phenazinoiminazole, 1805[8]
Hydrocinnamaldehyde, α,β - diketo methyl , bisphenylhydrazone, 1590[9]
$C_{22}H_{20}N_4O_2$ Hydrocinnamaldehyde, α,β diketo *p* methoxy-, bisphenylhydrazone, 1590[9]
$C_{22}H_{20}O$ 2 - Butanone, 1,3,4 - triphenyl-, 580[1].
Ethylene oxide, α,α - dibenzyl - β - phenyl-, 1610[8], 2850[7].
$C_{22}H_{20}O_2$ Xanthydrol, 9 - (γ - phenylpropyl)-, 2328[6]
$C_{22}H_{20}O_3$ 1 - Acrylonaphthone, β - *p* - anisyl- 2-ethoxy-, 1617[5].

$C_{22}H_{20}O_4$ Δ² - Cyclopentenone, 4,5 - dianisal-2-hydroxy-3-methyl-, 2484[8].
$C_{22}H_{20}O_4S$ Acetic acid, di - *p* - anisylphenylmercapto-, *and Ba salt*, 375[2].
$C_{22}H_{20}O_6$ Muconic acid, β,γ - dihydroxy - α,δ-di - *p* - tolyl-, monolactone, Et ester, 2849[6].
—, β - hydroxy - γ - methoxy - α,δ di - *p*-tolyl-, lactone, Me ester, 2849[6].
$C_{22}H_{20}O_9S$ Pyrogallolsulfonephthalein, tri-Me ether, *and Na salt*, 2491[5].
$C_{22}H_{20}O_{24}$, 967[6].
$C_{22}H_{21}AsN_2O_4$ Benzenearsonic acid, 3,4 - bis-(α-toluylamino)-, 1605[9].
$C_{22}H_{21}AuCl_4N_2O_2$ 1 - [γ - (1,3 - Dihydro - 1-hydroxy - 3 - keto - 1 - phenyl - 2 - isoindyl)propyl]pyridinium chloroaurate, 1408[3].
$C_{22}H_{21}BiO_4$ Bismuthine, triphenyl-, diacetate, 1063[4].
$C_{22}H_{21}IN_2$ 2,2′ - Biquinoline, dimethyl-, ethiodide, 205[4].
$C_{22}H_{21}NO$ Isobutyranilide, β,β′ - diphenyl-, 3451[9].
$C_{22}H_{21}NO_2$ Carbanilic acid, *p* - benzohydryl-, Et ester, 591[6].
p - Cresol, 2 - phenethyl, carbanilate, 748[8].
$C_{22}H_{21}N_3O_7$ Collidinedicarboxanilide, 1226[4].
$C_{22}H_{22}$ 2,1 - Indenoindene, 5,10 - diisopropyl-, 1235[2]
—, 5,10 dipropyl, 1235[2].
—, 4a,5,9a,10 - tetrahydro - 5,10 - diisopropylidene, 1235[2].
—, 4a,5,9a,10 - tetrahydro - 5,10 - dipropylidene, 1235[2].
$C_{22}H_{22}AsN_3O_7$ Arsanilic acid, *N* [3 - (3 - amino-4 - methoxybenzamido) - *p* - anisoyl]-, *and salts*, 394[4].
$C_{22}H_{22}Cl_2N_2O_2S$ Sulfone, bis(β - chloroethyl), diquinoline addn. compd, *chloroplatinate*, 40[4].
$C_{22}H_{22}I_4S$ Tribenzylsulfonium iodide, CHI_3 addn compd, 2815[9]
$C_{22}H_{22}N_2$ Benzidine, *N,N* - dimethyl - *N*′-methylbenzal, 587
Imidazole, 1 - benzyltetrahydro - 2,3 - diphenyl, 1627[9]
$C_{22}H_{22}N_2O$ Benzidine, *N*′ - anisal - *N,N* - dimethyl, 587[1].
$C_{22}H_{22}N_2O_2$ Carbazic acid, β - triphenylmethyl-, Et ester, 408[6]
$C_{22}H_{22}N_2O_2S$ Benzenesulfonamide, *N* - *o* - (1,3-dihydro - 2 - isoindylmethyl)benzyl, 418[1].
$C_{22}H_{22}N_2O_3S$ Acetophenone, α - (*o* - phenetylsulfonyl), phenylhydrazone, 420[1].
$C_{22}H_{22}N_4O_2Se$ Selenide, diantipyryl, 1364[2].
$C_{22}H_{22}O_2$ Methane, (2,4 - dimethoxyphenyl)-phenyl *o* tolyl, 2849[6].
Veratrole, 4 - (*o* - methylbenzohydryl), 2849[6].
$C_{22}H_{22}O_4$ 2 - Naphthol, 5,6,7,8 - tetrahydro, oxalate, 47[2].
$C_{22}H_{22}O_7$ Cinnamic anhydride, 3,4,3′,4′ - tetramethoxy-, 196[4].
$C_{22}H_{22}O_9$ Chalcone, 4′ - hydroxy - 3,4 - methylenedioxy-, glucoside, 593[3].
$C_{22}H_{23}ClO_9$ 4′ : β - Glucosidoxy - 7 - hydroxy-3 - methoxyflavylium chloride, 3297[4].
$C_{22}H_{23}HgI_2N_2$ Quinoline, complex salt with BuI and HgI_2, 3695[8].
$C_{22}H_{23}NO$ Phenethyl alcohol, β - amino - α,α dibenzyl-, 588[9], 2325[2].
$C_{22}H_{23}NO_2$ Δ² - Cyclohexenone, 5 - (*p* - dimethylaminophenyl) - 3 - (*o* - hydroxystyryl)-, 173[2].
$C_{22}H_{23}NO_3S$ Norcodeine, *N* - (2 - thienylmethyl)-, *and -HCl*, 3012[7].
$C_{22}H_{23}NO_6$ Hydrastine, methyl-, 1795[6].
Malonic acid, [β - (*p* - dimethylaminocinnamyl) - α - salicylethyl]-, 173[4].
$C_{22}H_{23}NO_7$ (See also *Narcotine.*)
Gnoscopine, 94[3].
$C_{22}H_{23}N_5$ Collidinedialdehyde, bisphenylhydrazone, 1226[4].
$C_{22}H_{23}N_5O_7$ Indazole, 2 - benzyl - 4,5,6,7 - tetrahydro - 4,6 - dimethyl, picrate, 389[6]
$C_{22}H_{23}N_5S_2$ Semicarbazide, thio - 4 - *o* - tolyl-1 - [*o* - (β - *o* - tolylcarbamido)phenyl]-, 745[7].
$C_{22}H_{24}Br_2Cl_2HgN_2$ Quinoline, complex salt with EtBr and $HgCl_2$, 3696[1], complex salt with EtCl and $HgBr_2$, 3696[1].
$C_{22}H_{24}Br_2HgI_2N_2$ Quinoline, complex salt with EtBr and HgI_2, 3696[1], complex salt with EtI and $HgBr_2$, 3696[1].
$C_{22}H_{24}Br_4HgN_2$ Quinoline, complex salt with EtBr and $HgBr_2$, 3696[1].
$C_{22}H_{24}Cl_2HgI_2N_2$ Quinoline, complex salt with EtCl and HgI_2, 3696[1], complex salt with EtI and $HgCl_2$, 3696[1]
$C_{22}H_{24}Cl_4HgN_2$ Quinoline, complex salt with EtCl and $HgCl_2$, 3696[1].
$C_{22}H_{24}HgI_4N_2$ Quinoline, complex salt with EtI and HgI_2, 3696[1].
$C_{22}H_{24}Mn_3N_2O_{16}$ + $9H_2O$, 720[2]
$C_{22}H_{24}N_2O_2$ Compd, m 103 6°, from 4 - (hydroxymethylene) - 1,3 - dimethylcyclohexanone benzoate and $PhNHNH_2.AcOH$, 389[4].
$C_{22}H_{24}N_2O_4$ Biacetoacetotoluide, 3822[4].
$C_{22}H_{24}N_2O_6$ Biacetoacetaniside, 3822[4].
$C_{22}H_{24}N_2O_6S_2$ Glutaranilic acid, *o,o*′ - dithiobis, 600[2]
$C_{22}H_{24}N_4O_2$ Δ² - Oxazoline, 4 - α (ethylcarbamylmethylimino)benzyl - 5 - ethylimino-2-phenyl, 1623[1].
$C_{22}H_{24}N_4O_4$ *o* - Acetoacetotoluide, 4,4′ - azobis-, P 1910[7].
$C_{22}H_{24}N_4O_{11}$ Nipecotic acid, 1 - hydroxy - 1,4-dimethyl-, Me ester, benzoate, picrate, 1810[5].
$C_{22}H_{24}O_3$ Naphthalene, 1 - (2,4,5 - trimethoxy-α,α - dimethylbenzyl)-, 2849[6].
$C_{22}H_{24}O_4$ Phenolsuccinein, 3 - cyclohexyl, 2676[7].
$C_{22}H_{24}O_8$ Chalcone, 4′ hydroxy - 4 - methoxy-, glucoside, 593[3].
Pseudocatechol, diacetyltrimethyl-, 3007[2]
$C_{22}H_{24}O_9$ Chalcone, 4,4′ - dihydroxy - 3 - methoxy, glucoside, 593[2].
$C_{22}H_{25}NO_6$ See *Colchicine.*
$C_{22}H_{25}N_3O_7$ *o* - Acetanisidide, 3 - nitro - 4 - [(1,2,3,4 - tetrahydro - 8 - methoxy - 2-methyl - 6,7 - methylenedioxy - 1 - isoquinolyl)methyl], 3458[2].
$C_{22}H_{25}N_5O_6$ Compd. from the hydrazide semicarbazone, of brucinonic acid, m. 215–25°, 1811[7]
$C_{22}H_{26}$ 2,1 - Indenoindene, 4a,5,9a,10 - tetrahydro - 5,10 - diisopropyl-, 1235[2].
—, 4a,5,9a,10 - tetrahydro - 5,10 - dipropyl, 1235[2].
$C_{22}H_{26}N_2O_3$ Benzoic acid, *p* benzamido-, 2-dimethylaminocyclohexyl ester, 2831[8].
Quinine, acetyl, 1926[3].
2 - Quinuclidinecarbinol, 5 - ethylidene - α-

(6 - methoxy - 4 - quinolyl)-, acetate, 1993[8].
$C_{22}H_{26}N_2O_4$ Lysuric acid, Et ester, 2983[3].
2,5 - Piperazinedione, 1,4 - bis(p - methoxybenzyl) - 1,4 - dimethyl-, 417[6].
$C_{22}H_{26}N_2O_{11}$ d-Glucose, benzoylureide, tetraacetate, 1596[2].
$C_{22}H_{26}N_4O_6$ 4,4′ - Bi - m - cresol, 2,6,2′,6′ - tetraacetamido-, 187[3].
$C_{22}H_{26}O_2$ 2,1 - Indenoindene, - 5,10 - diol, 4₂, - 5,9₂,10 - tetrahydro - 5,10 - diisopropyl-, 1235[2].
—, 4₂,5,9₂,10 - tetrahydro - 5,10 - dipropyl-, 1235[1].
$C_{22}H_{26}O_3$ Hydrobenzein, α - cyclohexyl , monoacetate, 1988[9].
$C_{22}H_{26}O_6$ Addn. compd , m 155°, of 5,6,7,8-tetrahydro - 2 - naphthol and oxalic acid, 47[2].
$C_{22}H_{26}O_8$ 2 - Propanone, 1 - (3,4 - dimethoxyphenyl) - 3 - hydroxy - 1 - (2,4,6 - trimethoxyphenyl)-, acetate, 2489[8].
$C_{22}H_{26}O_8S$ Glucose, diacetone - 3 - β - naphthalenesulfonyl-, 2662[8].
$C_{22}H_{27}NO_3$ Norcodeine, N - (cyclobutylmethyl)-, and salts, 3012[7].
—, N - cyclopropylethyl)-, *and -HCl*, 3012[7].
$C_{22}H_{27}NO_4$ Columbamine, tetrahydro , Et ether, 3294[9].
Palmatrubine, tetrahydro-, Et ether, 3295[2].
Phenanthrene, 1 - (β - dimethylaminoethyl)-3,4,6,7 - tetramethoxy-, 1406[2].
$C_{22}H_{27}N_3O_6$ o - Acetaniside, 3 - nitro - 4 - [(1,-2,3,4 - tetrahydro - 6,7 - dimethoxy - 2 - methyl - 1 - isoquinolyl)methyl]-, 3458[2].
$C_{22}H_{28}Br_2N_2$ Spiro[isoquinoline - 2,1′ - piperazine-4′,2″ - isoquinoline], N, N' - dibromo-1,2,3,4,1″,2″,3″,4″ - octahydro-, 2862[9].
$C_{22}H_{28}Cl_2N_2$ 9,10 - Anthradiamine, 1,5 - dichloro-N, N, N', N' - tetraethyl - 9,10 - dihydro-, 754[5].
$C_{22}H_{28}INO_4$ Boldine, di Me ether, methiodide, 1406[2].
$C_{22}H_{28}N_2O_3$ See *Yohimbine*.
$C_{22}H_{28}N_4$ Calycanthine, 916[7].
$C_{22}H_{28}N_4O_8$ Bicarbamic acid, N, N'' - 1,4-naphthylenebis , tetra-Et ester, 410[6].
$C_{22}H_{29}N$ Cyclohexylamine, 2 - benzyl - N-methyl - N - phenethyl-, *and -HCl*, 2665[6].
$C_{22}H_{29}N_3O_4$ o - Acetaniside, 3 - amino - 4 [(1,-2,3,4 - tetrahydro - 6,7 - dimethoxy-2 - methyl - 1 - isoquinolyl)methyl] , 3458[3].
$C_{22}H_{30}I_2N_2O_2$ 2 - Quinuclidinecarbinol, 5 - ethylidene - α - (6 - methoxy - 4 - quinolyl)-, dimethiodide, 1993[8].
$C_{22}H_{30}N_2O_3$ Benzamide, N - [δ - (ϵ - phenoxyamylamino)butyl] , *-HCl*, 417[8].
— , N - [ϵ - (δ - phenoxybutyl)aminoamyl] , *-HCl*, 417[9].
$C_{22}H_{30}N_2O_5$ Diphenethylamine, p,p'-bis(ethoxymethyl)-N-nitroso-, 391[7].
$C_{22}H_{30}N_2O_{12}$ Glucoside, tetraacetylveronal (?), 1596[2].
$C_{22}H_{30}O_5$ Dianhydrobigitaligenin, 2724[6].
$C_{22}H_{30}O_6$ Compd., m. 80-3°, from tetrahydrojatrorrhizine Et ether methiodide, 604[4].
$C_{22}H_{30}O_7$ Propane, 1 - (3,4 - dimethoxyphenyl)-2,3 - dimethoxy - 1 - (2,4,6 - trimethoxyphenyl)-, 2489[7].
$C_{22}H_{30}O_{14}$ Acid from digitoic acid, m. 113°, 1414[6].
$C_{22}H_{31}NO_3$ Diphenethylamine, bis(ethoxymethyl)-, *and -HCl*, 391[7,8].
$C_{22}H_{31}NO_{13}$ Acid from digitoic acid, decomps. 242°, 1414[3].
$C_{22}H_{32}$, 299[6].
$C_{22}H_{32}HgO_5$ Hydrocinnamic acid, α - (acetoxymercuri) - β - methoxy-, menthyl ester, 1986[7].
$C_{22}H_{32}MoN_2O_8$ + $2H_2O$ Piperidine dipyrogallolmolybdate, 3405[7].
$C_{22}H_{32}N_2O_8W$ + H_2O Piperidine dipyrogallol tungstate, 3405[9].
$C_{22}H_{32}O_6$ Pyro - anthropo - choloidanic acid, 918[7].
$C_{22}H_{33}BrN_2O_4S_2$ Pseudourea, α - ethyl - β,γ-dimethyl - α - phenylthio-, metho - α-bromocamphorsulfonate, 374[4].
$C_{22}H_{33}N$ Apoconessine, *and acid sulfate*, 3458[5].
$C_{22}H_{34}Br_4N_4$ Nicotine, di HBr, $C_2H_2Br_4$ addn. compd., 1086[5].
$C_{22}H_{34}CuO_8$ γ - Pentenic acid, α,α - diethyl - δ-hydroxy - β - keto , Et ester, Cu deriv., 1590[7].
$C_{22}H_{34}O_2$, 834[2].
$C_{22}H_{34}O_5$ Bigitaligenin, 2724[5].
$C_{22}H_{36}O_2$, 833[8], 834[2].
$C_{22}H_{36}O_4$ Camphor, 3 - methoxy , dimer(?), 2157[5].
$C_{22}H_{36}O_5$ Bigitaligenin, dehydro , 2724[6].
$C_{22}H_{37}NO$ Palmitanilide, 309[8].
$C_{22}H_{37}NO_2$ Abietic acid, $EtNH_2$ salt, 2166[1].
$C_{22}H_{38}CuO_4$ Δ^3 - 2 - Hendecenone, 4 - hydroxy , Cu deriv., 738[9].
$C_{22}H_{38}N_2O_2S$ Compd., m. 105-6°, from thionocarbamic acid and H_2O_2, 373[5].
$C_{22}H_{38}O_2$ Menthone, 2,2′ ethylenebis-, 2846[2].
$C_{22}H_{38}O_5$ Bigitaligenin, tetrahydro , 2724[6].
$C_{22}H_{39}CoN_2O_4S$, 716[6].
$C_{22}H_{40}O_2$ Behenolic acid, 2310[7], 2601[5].
$C_{22}H_{40}O_4$ 1,3,3a - Cyclopentadioxole - 4 - tridecoic acid, 4,5,6,6₁ - tetrahydro - 2,2 dimethyl-, Me ester, 2315[3,4].
$C_{22}H_{42}BrIO_2$ Behenic acid, bromoiodo-, *and Ca salt*, 1592[3].
$C_{22}H_{42}O_2$ (See also *Erucic acid*.)
Brassidic acid, 2310[8]. *Tl salt*, 2818[2].
2,4 - Docosanedione, 739[1].
$C_{22}H_{42}O_3$ Behenic acid, ι - keto-, 3445[5].
$C_{22}H_{42}O_4$ 1,16 - Hexadecanedicarboxylic acid, di Et ester, 1789[4].
$C_{22}H_{43}IO_3$ Behenic acid, hydroxyiodo , *and Ca salt*, 1592[3].
$C_{22}H_{43}N$ Chaulmoogrylamine, N, N - diethyl , *and -HCl*, 3160[2].
$C_{22}H_{44}O$ Ketone, eicosyl methyl, 738[9].
$C_{22}H_{44}O_2$ Behenic acid, 738[7], *Na salt*, 1160[9], 3617[9].
Stearic acid, Bu ester, 2818[9].
$C_{23}H_{17}NO_4$ 1,2 - Pyran - 2 ol, 2 (and 4) - (m-nitrophenyl) - 4,6 (and 2,6) - diphenyl , *and perchlorate*, 417[3,4].
$C_{23}H_{16}Br_4O_4$ 1,2 - Ethanediol, 1,2 - bis(2 - hydroxy - p - anisyl) - 1 - methoxy - 2 - phenyl , anhydride, tetra - Br deriv., 2324[4].
$C_{23}H_{16}ClNO_3$ 2 (and 4) - (m - Nitrophenyl)-4,6 (and 2,6) - diphenylpyrylium chloride, *FeCl₃ compd.*, 417[1,3].
$C_{23}H_{16}N_2O$ 2 - Cyclopentaquinoxalin - 2 - one, 1,3 - dihydro - 1,3 - diphenyl-, 207[9].
$C_{23}H_{16}N_2O_2$ Pyridine, 2 (and 4) - (m - nitrophenyl) - 4,6 (and 2,6) - diphenyl-, *and perchlorate*, 417[2,3].
$C_{23}H_{16}N_2O_2S$ 2 - Cyclopentaquinoxaline - 1

sulfonic acid, 1,3 - dihydro - 2 - keto-1,3-diphenyl-, 207[7].

$C_{23}H_{16}N_4O_4$ 1 - Naphthanilide, 3 - hydroxy - 4-(*p* - nitrophenylazo)-, 1233[4].

$C_{23}H_{16}N_6O_{14}$ 1 - (*p* - Aminophenyl)pyridinium picrate, picrate, 586[2].

$C_{23}H_{16}O_3$ Acetate of compd. from 10-bromo-10-(*α* - bromobenzyl)anthrone, m. 140–1°, 3453[2].

$C_{23}H_{16}O_4$ Chromone, 7 - hydroxy - 2,3 - diphenyl-, acetate, 196[9].

Malonic acid, di-2-naphthyl ester, 1233[7].

Umbelliferone, 3,4 - diphenyl-, acetate, 595[2].

—, 4 - methyl - 3 - phenyl-, benzoate, 595[6].

$C_{23}H_{17}BrN_2O_3S$ 4 - Thiazolidone, 5 - (5 - bromovanillal) - 3 - phenyl - 2 - phenylimino , 1980[8].

$C_{23}H_{17}ClN_2O_3S$ 4 - Thiazolidone, 5 - (5 - chlorovanillal) - 3 - phenyl - 2 - phenylimino , 1980[8].

$C_{23}H_{17}ClO_6$ 2 - [*m* (and *p*) - Hydroxyphenyl]-4,6 - diphenylpyrylium perchlorate, 417[4].

$C_{23}H_{17}N$ Quinoline, 2 - phenyl - 4 - styryl , *and salts*, 2680[9], 2681[2].

$C_{23}H_{17}NO_3$ Benzil, *α* - oxime, cinnamyl deriv., 1230[6].

2,7 - Naphthalenediol, diphenylcarbamate, 911[1].

$C_{23}H_{17}N_3O$ Cinchophen, benzalhydrazide, 3010[8].

$C_{23}H_{17}N_3O_5S$ 4 - Thiazolidone, 5 - (5 - nitrovanillal) - 3 - phenyl - 2 - phenylimino , 1980[8].

$C_{23}H_{18}BrNO_4S_2$ Quinaldine, 3 - (*p* - bromophenylsulfonyl) - *α* - *p* - tolylsulfonyl-, 1626[1].

$C_{23}H_{18}BrNO_5S_2$ Quinaldine, *α* - (*o* - anisylsulfonyl) - 3 - (*p* - bromophenylsulfonyl)-, 1626[1].

$C_{23}H_{18}ClNO_2$ 4 - (*p* - Aminophenyl) - 2 - (*p*-hydroxyphenyl) - 6 - phenylpyrylium chloride, *and* · *HCl*, 758[4].

$C_{23}H_{18}ClNO_3$ 4 - (*p* - Aminophenyl) - 2,6 - bis (*p* - hydroxyphenyl)pyrylium chloride, *HCl*, 758[4]

$C_{23}H_{18}ClNO_5$ 4 - (Aminophenyl) - 2,6 - diphenylpyrylium perchlorate, 758[4]; *perchlorate*, 417[3].

$C_{23}H_{18}ClNO_7$ 4 - (*p* - Aminophenyl) - 2,6 - bis (*p* - hydroxyphenyl)pyrylium perchlorate, 758[4].

$C_{23}H_{18}NNaO_2$ 1,2,6 - Oxazin - 5 - ol, 6 - methoxy-3,4,6 - triphenyl , Na deriv., 1239[8].

$C_{23}H_{18}N_2$ Pyridine, 2 (and 4) - (*m* - aminophenyl) - 4,6 (and 2,6) - diphenyl , *and perchlorate*, 417[2, 3].

$C_{23}H_{18}N_2O_2$ *α*,*γ* - Dibenzophenazine, 11 - ethoxy-12-methoxy-, 1608[1].

Urea, *α* - 1 - naphthyl - *β* - (*p* - phenoxyphenyl)-, 1603[4].

$C_{23}H_{18}N_2O_3S$ 4 - Thiazolidone, 3 - phenyl - 2-phenylimino - 5 - vanillal-, 1980[8].

$C_{23}H_{18}N_4O_7$ Quinoline, dimethyl - 2 - phenyl , picrate, 418[3, 4].

$C_{23}H_{18}N_4O_8$ Lepidine, methoxy - 2 - phenyl-picrate, 418[2, 3, 4].

$C_{23}H_{18}OS$ Sulfoxide, diphenylmethyl 1 - naphthyl, 2669[8].

$C_{23}H_{18}OS_2$ Thiochromone, 6 - methyl - 3 - *α*-phenylmercaptobenzyl-, 203[7].

$C_{23}H_{18}O_2$ 9 - Anthrol, 10 - benzyl-, acetate, 3453[2].

Ketone, 9,10 - dihydro - 9 - anthryl phenyl, acetate, 3293[1].

$C_{23}H_{18}O_8$ Chromone, 3,5,7 - trihydroxy - 2 - styryl-, triacetate, 196[3].

$C_{23}H_{18}S$ Sulfide, diphenylmethyl - 1 - naphthyl, 2669[8].

$C_{23}H_{19}BrO_3$ 5,7 - Dimethoxy - 2,4 - diphenylbenzopyrylium bromide, 2499[2].

$C_{23}H_{19}ClO_5$ 9 - (4 - Hydroxy - 3 - methoxystyryl)-xanthylium chloride, HCO_2H addn. compd., 1807[1].

$C_{23}H_{19}ClO_7$ 5,7 (and 7,8) - Dimethoxy - 2,4-diphenylbenzopyrylium perchlorate, 2499[2].

$C_{23}H_{19}NOS_2$ 8 - Quinolinol, 5,7 - bis(*p* - tolylmercapto)-, 3289[7].

$C_{23}H_{19}NO_2$ 1,2 - Pyran - 2 - ol, 4 - (*m* - aminophenyl) - 2,6 - diphenyl-, *and* -*HBr*, 417[3].

$C_{23}H_{19}NO_3$ Benzanilide, *p* - (*β* - anisoylvinyl)-, perchlorate, 2156[8].

1,2,6 - Oxazin - 5 - ol, 6 - methoxy - 3,4,6-triphenyl , 1239[8].

$C_{23}H_{19}NO_3S$ Quinoline, 3 - [*o* (and *p*) - phenetylsulfonyl] - 2 - phenyl , *and salts*, 420[1].

$C_{23}H_{19}NO_6$ 5,7 - Dimethoxy - 2,4 - diphenylbenzopyrylium nitrate, 2499[2].

$C_{23}H_{19}N_3OS$ 2(3) - Thiazolone, 3,4 - diphenyl-, anisalhydrazone, 416[3].

$C_{23}H_{19}N_3O_4$ Compd., m. 226°, from *p* - aminobenzoic acid and Ac_2O, 1066[5].

$C_{23}H_{19}N_5OS$ 1,3,4 - Triazole, 2 - (benzalhydrazino) - 1 - benzoyl - 5 - (benzylmercapto)-, 2162[3].

$C_{23}H_{19}N_5S$ 1,3,4 - Triazole, 1,2 - bis(benzalamino) - 5 (benzylmercapto)-, 2162[3].

$C_{23}H_{20}ClNO_3$ + H_2O 9 - (*p* - Dimethylaminostyryl)-3,6 - dihydroxyxanthylium chloride, 1807[2].

$C_{23}H_{20}INO_2S$ 3 - (Anisylsulfonyl) - 1 - methyl-2 - phenylquinolinium iodide, 419[9], 420[1].

$C_{23}H_{20}N_2O$ Benzoic acid, *β* - (*β* - benzalisopropylidene) - *α* - phenylhydrazide, 2494[7].

$C_{23}H_{20}N_2O_2$ *o* - Toluic acid, *α* - (1 - keto - 2-indanyl)-, phenylhydrazide, 1620[2].

$C_{23}H_{20}N_4OS$ Δ^2 - 1,2,4 Triazoline, 1 - acetyl-3 - (benzylmercapto) - 4 - phenyl - 5-phenylimino , 2162[3].

$C_{23}H_{21}NO_4$ Benzanilide, 6 - hydroxy - 2,3,4-trimethyl-, benzoate, 2154[8].

$C_{23}H_{21}N_3O_3$ Triazinedione, ethyldihydrotriphenyl-, 3168[9]

$C_{23}H_{21}N_3O_3$ Benzamide, *N* - *o* - (1,3 - dihydro-2 - isoindylmethyl)benzyl - *p* - nitro-, 418[1].

Isatic acid, *N* - benzoyl , Et ester, phenylhydrazone, 2997[5].

$C_{23}H_{21}N_5O_7$ Δ^3 - 2 - Butenone, 4 - phenyl-, *p*-tolylhydrazone, picrate, 761[9].

$C_{23}H_{22}N_2O$ Isoindoline, 2 - *o* - (salicylalaminomethyl)benzyl , 418[1].

$C_{23}H_{22}N_2S$ 1,4 - Thiopyrone, tetrahydro - 2,6-diphenyl , phenylhydrazone, 200[1].

$C_{23}H_{22}N_4S$ 1,3,4 - Triazole, 2 - (benzylmercapto)-5-*p* toluino-1-*p* tolyl-, 2162[1].

$C_{23}H_{22}O$ 2 - Butanone, 3 - benzyl - 1,4 - diphenyl , 589[1].

$C_{23}H_{22}O_4$ Acetophenone, *α* - asaryl - *α* - phenyl , 2849[9].

$C_{23}H_{22}O_4$ Muconic acid, *β* - ethoxy - *γ* - hydroxy-*α*, *δ* - di - *p* - tolyl-, lactone, Me ester, 2849[6].

—, *β* - hydroxy - *γ* - methoxy - *α*, *δ* - di - *p*-tolyl-, lactone, Et ester, 2849[5].

$C_{23}H_{22}O_5S$ *m* - Cresolsulfonephthalein, di-Me ether, 3001[1].

$C_{23}H_{22}O_6$ Malonic acid, (α - 1,3 - diketo - 2-indanylbenzyl)-, di-Et ester, 911[9].

$C_{23}H_{23}N$ Indanamine, *N* - benzyl - *N* - tolyl-, 2156[1,2].

$C_{23}H_{23}NO$ Isobutyrotoluide, *β,β'* - diphenyl , 3451[9].

$C_{23}H_{23}NO_4$ Δ[3] - Cyclohexenecarboxylic acid, 6-(*p* - dimethylaminophenyl) - 4 - (*o* - hydroxystyryl) - 2 - keto-, 173[2]

$C_{23}H_{24}N_2$ 3,6 - Fluorenediamine, *N*, *N*, *N'*, *N'*-tetramethyl-9-phenyl-, 2837[1].

$C_{23}H_{24}N_2O_4S_2$ 2 - Propanone, 1 - (*o* - anisylsulfonyl) - 3 - *p* - tolylsulfonyl-, phenylhydrazone, 1625[7].

$C_{23}H_{24}N_2O_6$ Ecgonine, *p* - nitrobenzyl ester, benzoate, P 2228[4].

$C_{23}H_{24}N_4O_2$ Urea, benzalbis[tolyl-, 3169[1].

$C_{23}H_{24}O_3$ Ethane, 1 - asaryl - 1,1 (and 1,2)-diphenyl)-, 2849[8].

Methane, asarylphenyl - *o* - tolyl-, 2849[8].

$C_{23}H_{24}O_7$ Δ[2,4] - 1 - Pentadienone, 1 - (*p* - hydroxyphenyl) - 5 - phenyl , glucoside, 593[3].

$C_{23}H_{24}O_9$ Compd. from tetraacetylsantalin, carbonizes without m. 270–80°, 1405[8].

$C_{23}H_{24}O_{12}$ Glucodaphnetin, tetraacetyl-, 1070[3].

$C_{23}H_{25}ClO_9$ 4' - *β* - Glucosidoxy - 7 - hydroxy-3 - methoxy 5 - methylflavylium chloride, 3297[5]

$C_{23}H_{25}NO_3$ Δ[2] - Cyclohexenone, 3 - (*p* - dimethylaminostyryl) - 5 - hydroxyanisyl , 173[2,4].

ε - Truxillpiperididic acid, 1391[6]

$C_{23}H_{25}NO_4$ (See also *Lanthopine.*)

Ecgonine, benzyl ester, benzoate, *and -HCl and -HNO*$_3$, P 2228[4].

Pseudoecgonine, benzyl ester, benzoate, P 2228[4].

$C_{23}H_{25}NO_5$ Ecgonine, benzyl ester, salicylate, P 2228[4].

—, *o* - hydroxybenzyl ester, benzoate, P 2228[4].

$C_{23}H_{26}N_2$ *p* - Benzenimine, 4 (4,4' diamino 3,5,3',5' - tetramethylbenzohydrylidene)-, *-HCl*, 3000[8].

$C_{23}H_{26}N_2O$ Semicarbazide, 1,2 - bis(α - methylbenzyl) - 4 - phenyl , 1604[4]

$C_{23}H_{26}N_4O_4$ Isatic acid, *N* - carboxy , Et ester, phenylhydrazone, PhNHNH$_2$ salt, 2997[8].

$C_{23}H_{26}AsBr$ Benzylmesitylmethylphenylarsonium bromide, 393[4]

$C_{23}H_{26}N_2O_4$ (See also *Brucine.*)

o - Acetoacetotoluide, 4,4' - methylenebis , P 1910[8].

$C_{23}H_{26}N_2O_6$ Carbamic acid, malonylbis[benzyl , diethyl ester, 3164[3].

$C_{23}H_{26}N_4O_7$ Compd. from the hydrazone of Et brucinonate, m. 236°, 1811[8].

$C_{23}H_{26}N_4O_{12}$ 5 - Desoxymorphinic acid, dihydro , picrate, 2165[8].

$C_{23}H_{26}O_4$ Dilactone, m. 253-4°, from dianhydrostrophanthidin, 601[1].

Phenolglutarein, 4 - cyclohexyl , 2670[8].

$C_{23}H_{26}O_9S$ Glucose, benzoyl - *p* - toluenesulfonylmonoacetone , 2985[3,4].

$C_{23}H_{27}NO_8$ + 3H$_2$O See *Narceine.*

$C_{23}H_{27}N_3$ Compd., m. 187°, from 2 picoline and *p,p'* - bis(dimethylamino)benzohydrol, 1627[7]

$C_{23}H_{27}N_3O_4$ Isoquinoline, 1 - (2,4 - diacetamidobenzyl) - 1,2,3,4 - tetrahydro 8 - methoxy 2 - methyl - 6,7 - methylenedioxy-, 3457[9].

$C_{23}H_{28}N_4$ α - Tolunitrile, *N*, *N'* - heptamethylenebis[α - amino-, *and di-HCl*, 371[1].

$C_{23}H_{28}N_6O_4$ Compd. from the hydrazone of Et brucinonate, foams 220–30°, 1811[8].

$C_{23}H_{28}O_4$ Malonic acid, bis(γ - phenylpropyl) , mono-Et ester, 911[3].

$C_{23}H_{28}O_4S_2$ Acetone, bis(γ - hydroxypropyl)-mercaptole, dibenzoate, 737[4].

$C_{23}H_{28}O_8$ Lactone acid, m. 268°, from dianhydrostrophanthidin, 601[1].

$C_{23}H_{28}O_8$ Keto-dilactone, m. 285°, from pseudostrophanthidin, 600[9].

$C_{23}H_{28}O_{10}S_2$ Glucose, 3,6 (and 5,6) - di - *p*-toluenesulfonylmonoacetone-, 2984[9].

$C_{23}H_{28}O_{12}$ Acetophenone, *p* - tetraacetyl - *β*-glucosidoxy - ω - methoxy-, 3297[3].

$C_{23}H_{29}IN_2O_4$ 10 - Acetamido - 5,6,6$_1$,7 - tetrahydro - 1,2,11 - trimethoxy - 6,6 - dimethyl - 6,4 *peri* - naphthoquinolinium iodide, 3458[3].

$C_{23}H_{29}NO_3$ Norcodeine, N (cyclopentylmethyl)- *and -HCl*, 3012[7].

$C_{23}H_{29}NO_4S_2$ Aniline, tolylsulfinyl , camphorsulfonate, 3448[6].

$C_{23}H_{29}NO_8$ Oxime, m. above 285°, of the keto dilactone from pseudostrophanthidin, 601[1]

$C_{23}H_{29}NO_8$ Pyroxonitine, 765[4]

$C_{23}H_{30}INO_4$ Jatrorrhizine, tetrahydro , Et ether, methiodide, 604[4]

Trimethyl[β - (3,4,6,7 - tetramethoxy - 1 phenanthryl)ethyl]ammonium iodide, 1406[7]

$C_{23}H_{30}N_2O_4$ α Toluic acid, N, N' heptamethylenebis[α amino , *and salts*, 371[2].

—, N, N' - trimethylenebis[α - amino , di Et ester, *and di HCl*, 370[8]

$C_{23}H_{30}N_2O_8$ 2,4 Pyrroledicarboxylic acid, 5,5' methylenebis[3 methyl , tetra Et ester, 2159[7]

$C_{23}H_{30}O_7$ Tetrahydrolactone, m 275 7°, from dianhydrostrophanthidin, 601[1]

$C_{23}H_{30}O_8$ Acid, m 249-51°, from dianhydrostrophanthidin, 601[1]

Dilactone, m 235-6, from strophanthidin, 600[8]

$C_{23}H_{32}IN$ 2 - Benzylcyclohexyldimethylphenethylammonium iodide, 2665[4,5]

$C_{23}H_{32}O_7$ Hexahydrolactone, m 265 7°, from dianhydrostrophanthidin, 601[1].

$C_{23}H_{32}O_8$ Dilactone, m 242 4°, from dihydrostrophanthidin, 600[8].

$C_{23}H_{33}NO_2$ 1 Dodecanol, 1 - naphthalenecarbamate, 1232[8].

$C_{23}H_{33}NO_4S$ Acridine, 1,2,3,4,4$_1$,5,10,10$_1$ - octahydro , camphorsulfonate, 1628[6]

$C_{23}H_{34}N_4O_{12}$ Dinicotinic acid, 1,4,?,? - tetrahydro - 4 - isobutyl 1,2,6 - trimethyl , di Et ester, styphnate, 3296[4].

$C_{23}H_{34}O_6$ Dianhydrostrophanthidin, hexahydro-, 208[4]

$C_{23}H_{34}O_7$ Lactone acid from dihydrostrophanthidin, 600[8].

$C_{23}H_{34}O_{11}$ Cyclopentanetricarboxylic acid, dicarboxypropylketo , pentaethyl ester, 3440[4,5].

$C_{23}H_{35}N_3O_2$ Civetone, *p* nitrophenylhydrazone, 1791[1].

$C_{23}H_{36}$ Hydrocarbon, m 117°, 916[4]

$C_{23}H_{38}IN$ Apoconessine, methiodide, 3458[3].

$C_{23}H_{36}O_5$ Desoxyoctahydrodianhydrostrophanthidin, 208[4].

Pyroisolithobilianic acid, 2166[8].

$C_{23}H_{36}O_6$ Dianhydrostrophanthidin, octahydro-, 208[4].

$C_{23}H_{34}O_6$ Acid, m. 233°, from 13 - hydroxylithobilianic acid, 2166[9].
$C_{23}H_{36}O_6$ Acid, 918[6].
$C_{23}H_{37}NO_2$ Muscol, carbanilate, 2834[3].
$C_{23}H_{38}O$ 10,13 - Tricosadiin - 12 - one, 1783[9].
$C_{23}H_{38}O_3$ Desoxypyrolithobilianic acid, 2167[1].
$C_{23}H_{41}NO_2$ Di(campholacyl)methylamine, 1399[4].
$C_{23}H_{44}O_2$ Erucic acid, Me ester, 1590[2].
2,4 - Tricosanedione, 739[1].
$C_{23}H_{44}O_4$ 1,17 - Heptadecanedicarboxylic acid, di-Et ester, 1789[3].
$C_{23}H_{46}O$ Ketone, heneicosyl methyl, 738[3].
$C_{23}H_{46}O_2$ Stearic acid, Am and isoamyl esters, 2818[9].
$C_{23}H_{48}O$ 12 - Tricosanol, 2819[2].
$C_{24}H_{10}N_8O_{19}$ Benzene, 1,3,5 - tris(dinitrophenoxy) - 2,4 - dinitro-, 2668[1].
$C_{24}H_{10}O_8$ 2,9 - ββ - Dibenzanthracenedicarboxylic acid, 5,7,12,14 - tetrahydro-5,7,12,14 - tetraketo-, 385[9].
$C_{24}H_{12}Cl_4O_7$ Fluoran, 12,13,14,15 - tetrachloro-3,4 - dihydroxy, diacetate, 3001[7]
$C_{24}H_{12}Cl_6O_2S_3$ Resorcinol, 2,4,6 - tris(2,5 - dichlorophenylmercapto), 3289[7].
$C_{24}H_{12}Cl_6O_3S_3$ Phloroglucinol, 2,4,6 - tris(2,5 dichlorophenylmercapto), 3289[7].
$C_{24}H_{12}N_4O$ o - Naphthoylene - 2,3 - phenazinoiminazole, 1805[6]
$C_{24}H_{12}N_6$ Diquinoxalophenazine, 2837[1].
$C_{24}H_{12}O_2$ $\Delta^{7,7'(8,8')}$ - Bi[acenaphthene] - 8,8'-dione, 1234[7]
$C_{24}H_{13}N_5$ Triazolacenaphthoquinoxaline, 5-phenyl, 1081[4].
$C_{24}H_{14}$ Butadiine, di 1 naphthyl, 1783[4].
$C_{24}H_{14}BrNO_4S$ Quinophthalone, 3' - (p - bromophenylsulfonyl), 1626[6]
$C_{24}H_{14}Cl_4O_6$ Isophenolphthalein, tetrachloro, diacetate, 596[6]
$C_{24}H_{14}O$ $\Delta^{7,7'(8,8')}$ - Bi[acenaphthene] - 8 - one, 1234[7].
$C_{24}H_{14}O_{10}$ Terephthalic acid, 2,5 - bis(p - carboxybenzoyl), *and Ba salt*, 385[9].
$C_{24}H_{15}Cl_3N_2O_3$ Quinone, 2,5 - dianilino - 3-(2,4,6 - trichlorophenoxy), 2319[1]
$C_{24}H_{15}Cl_3O_2S_3$ Resorcinol, 2,4,6 - tris(p - chlorophenylmercapto)-, 3289[7]
$C_{24}H_{15}Cl_3O_3S_3$ Phloroglucinol, 2,4,6 tris(p-chlorophenylmercapto), 3289[8].
$C_{24}H_{15}NO_3$ 3,4 - Furandicarboximide, N,2,5-triphenyl, 386[4]
$C_{24}H_{15}N_3$ αηα' - Tribenzophenazine, 11 amino, - H_2SO_4, 602[3]
$C_{24}H_{15}N_3O_9$ Benzene, 1,3,5 - trinitro - 2,4,6-triphenoxy-, 2317[2].
$C_{24}H_{15}N_3O$ 4,5 - Acenaphthotriazoledione, 8-phenyl, phenylhydrazone, 1081[4].
$C_{24}H_{16}$ $\Delta^{1,1'}$ - Biacenaphthene, 1234[6].
$C_{24}H_{16}Br_2CdO_6$ 2 - Naphthoic acid, 4 - bromo-3 - hydroxy-, Me ester, Cd deriv., 910[6]
$C_{24}H_{16}Br_4Cr$ Tetrakis(p - bromophenyl)chromium bromide, 2668[4].
$C_{24}H_{16}N_2$ Quinoxaline, naphthylphenyl, 1401[8].
$C_{24}H_{16}N_2O_2$ Phthalimide, N - (2 - phenyl - 4-quinolylmethyl), 204[9].
$C_{24}H_{16}N_2O_7$ Benzene, 2,4 - dinitro - 1,3,5 - triphenoxy-, 1222[8]
$C_{24}H_{16}N_4O_4S_4$ Compd. from diazotized thianthrenediamine and resorcinol, 2681[4].
$C_{24}H_{16}N_4O_8Sn$ Stannane, tetrakis(p - nitrophenyl)-, 585[7].
$C_{24}H_{16}N_4O_9$ 4 - Quinolineacrylic acid, 2 - phenyl-, picrate, 1413[4].
$C_{24}H_{16}O_4$ 2,7 - Naphthalenedicarboxylic acid, di-Ph ester, 1619[6].
$C_{24}H_{16}O_6S$ Dehydro - 2,4 - hydroxynaphthoic acid sulfide, di-Me ester, 1233[9].
$C_{24}H_{17}BrN_2O$ 2 - Cyclopentaquinoxalin - 2-one, 8 - bromo - 1,2 - dihydro - 6 - methyl-1,3-diphenyl-, 207[7].
$C_{24}H_{17}ClN_2O$ 2 - Cyclopentaquinoxalin - 2 - one, 6 - chloro - 1,3 - dihydro - 7 - methyl-1,3-diphenyl-, 207[7].
$C_{24}H_{17}Cl_4NO_8$ Triacetate of compd. from 2-anilino - 3 - chloro - 5 - (2,4,6 - trichlorophenoxy)quinone, 2318[9].
$C_{24}H_{17}NO_3$ Benzamide, N - (8 - hydroxy - 1-naphthyl)-, benzoate, 1073[6].
$C_{24}H_{17}NO_6$ Tartrimide, N - phenyl-, dibenzoate, 1789[6].
$C_{24}H_{17}N_3$ 5,6 - Benzoquinoxaline, 6 - amino-2,3-diphenyl-, *and salts*, 602[9].
$C_{24}H_{17}N_3O_3$ Phenol, p - [p - (4 - keto - 1 - pyridyl) - phenylazo]-, benzoate, 586[5].
$C_{24}H_{17}N_3O_8$ Ketone, benzyl naphthyl, picrate, 1401[8].
$C_{24}H_{18}$ Benzene, 1,3,5 - triphenyl-, 207[9].
$C_{24}H_{18}As_2N_2O$ Phenarsazine, 1,1' - oxybis[1,6-dihydro-, 3058[1].
$C_{24}H_{18}BiN_6O_{18}$ Bismuthine, tris(4 - carboxy-2 - nitrophenyl)-, dinitrate, tri-Me ester, 1063[6]
$C_{24}H_{18}Br_2Cl_2N_2$ 1,1' - (1,4 - Dichloro - 9, 10-dihydro 9,10 anthrylene)bispyridinium dibromide, 3166[4].
$C_{24}H_{18}CaO_8Sn$ + $4H_2O$, 3404[2].
$C_{24}H_{18}CdO_6$ 2 - Naphthoic acid, 3 - hydroxy-, Me ester, Cd deriv, 910[9].
$C_{24}H_{18}ClNO_4$ Oxazinol, (chlorophenyl)methoxyphenyl-, benzoate, 3168[6].
$C_{24}H_{18}ClN_3O_5$ 12 - (p - Acetamidophenyl) - 12-α - benzophenazonium perchlorate, 602[2].
$C_{24}H_{18}Cl_2O_2Te$ Bis(p - phenoxyphenyl)tellurium dichloride, 1063[8].
$C_{24}H_{18}Cl_4N_2$ 1,1' - (1,5 - Dichloro - 9,10 - dihydro - 9,10 - anthrylene)bispyridinium dichloride, 754[5].
$C_{24}H_{18}Cl_4O_2$ Phthalide, 3,4,5,6 - tetrachloro-2 - (2,3 - xylyl) - 2 - (3,4 - xylyl), 1231[3].
$C_{24}H_{18}CuO_6$ 2 - Naphthoic acid, 3 - hydroxy-, Me ester, Cu deriv., 910[9].
$C_{24}H_{18}MgO_4$ Ketone, methyl 1 - hydroxy - 2-naphthyl, Mg deriv., 399[3].
$C_{24}H_{18}N_2$ Azobenzene, p,p' - diphenyl-, 2848[2].
$C_{24}H_{18}N_2O$ Azoxybenzene, p,p' - diphenyl-, 2848[2].
1,2 - Cyclopentaquinoxalin - 2 - one, 1,3-dihydro - 6 - methyl - 1,3 - diphenyl-, 207[7].
$C_{24}H_{18}N_2OS$ 4 - Thiazolidone, 5 - cinnamal - 3-phenyl - 2 - phenylimino-, 1980[7].
$C_{24}H_{18}N_2O_2$ Benzamide, N,N' - 1,4 - naphthylenebis-, 410[6].
Benzophenone, oxime, 1 - naphthalenecarbamyl deriv., 2319[5].
1 - Naphthaleneacetanilide, 2 - hydroxy-α-phenylimino-, 597[9].
2,7 - Naphthalenedicarboxanilide, 1619[3].
$C_{24}H_{18}N_2O_9$ Isobutyrophenone, β,β' - bis(4,5-methylenedioxy - 2 - nitrophenyl)-, 2326[1].
$C_{24}H_{18}N_3NaO_3S$ Compd. from 3 - amino - 1-acenaphthenesulfonic acid, 411[4].
$C_{24}H_{18}N_4O_2$ Dibenzophenazine, diacetamido, 603[1,2].
$C_{24}H_{18}N_4O_7$ Quinoline, 2 - phenyl - 4 - propenyl-, picrate, 2681[2].
$C_{24}H_{18}N_4O_8$ 3,4 - Pyrazoledicarboxylic acid, 1,1'-p - biphenylenebis[5 - methyl-, *and K salts*, 599[3].

$C_{24}H_{18}N_4O_9$ 4 - Quinolinepropionic acid, 2-phenyl-, picrate, 1413[5].
$C_{24}H_{18}N_4O_{10}$ 4 - Quinolinepropionic acid, 6-hydroxy - 2 - phenyl-, picrate, 1413[5].
$C_{24}H_{18}N_6O$ Phenol, *p* - [*p* - (*p* - phenylazophenylazo)phenylazo]-, 2836[8].
$C_{24}H_{18}N_6O_2$ Azoxybenzene, *o,o'* - bis(phenylazoxy)-, 2836[1].
$C_{24}H_{18}N_6O_6S_4$ Thianthrene, 2,6 bis(*p* - sulfophenyltriazeno)-, 2681[8].
$C_{24}H_{18}O_2$ 1 - *meso* - Benzanthren - 7 - ol, 2,3-dihydro-, benzoate, 1404[5].
Isoflavone, 6 - methyl - 2 - styryl-, 1237[8].
2,2' - Spirobi[4,2 - benzopyran], 3 - benzyl-, 3008[4].
Xanthydrol, 9 - (1 - naphthylmethyl)-, 2328[6].
$C_{24}H_{18}O_2Te_2$ Ditelluride, bis(*p* - phenoxyphenyl), 1063[8].
$C_{24}H_{18}O_3$ Indone, 3 - (α - hydroxybenzyl) - 2-phenyl-, acetate, 1804[3].
Isoflavone, 7 - methoxy - 2 - styryl-, 196[8].
$C_{24}H_{18}O_4$ Flavone, 3 - benzyl - 7 - hydroxy-, acetate, 197[1].
$C_{24}H_{18}O_5$ Compd. from 3 - (α - hydroxybenzyl)-2-phenylindone acetate, m. 144–5°, 1804[4].
Umbelliferone, 4 - *p* - anisyl - 3 - phenyl, acetate, 595[4].
$C_{24}H_{18}O_6S$ Iso - 2,4 - hydroxynaphthoic acid sulfide, di-Me ester, 1233[9].
1 - Naphthoic acid, 4,4' - thiobis[3 - hydroxy-, di-Me ester, 1233[9].
$C_{24}H_{18}O_7$ Propionic acid, β - (β - resorcylyl)-, dibenzoate, 2996[1].
$C_{24}H_{19}ClN_4O$ 5 - Acetamido - 12 - (*m* - aminophenyl) - 12 - α - benzophenazonium chloride, 602[4].
12 - (*m* - Acetamidophenyl) - 5 - amino - 12-α - benzophenazonium chloride, 602[4].
$C_{24}H_{19}ClN_4O_5$ 5 - Acetamido 12 - (*m* - aminophenyl) - 12 - α - benzophenazonium perchlorate, 602[4].
12 - (*m* - Acetamidophenyl) - 5 - amino - 12-α - benzophenazonium perchlorate, 602[4].
$C_{24}H_{19}ClO_6$ 2 - *m* (and *p*) - Anisyl - 4,6 - diphenylpyrylium perchlorate, 417[4].
3 - Benzoyl - 2 - (*o* - hydroxystyryl)benzopyrylium perchlorate, 3008[4].
$C_{24}H_{19}Cl_2NO_3$ Dichloro deriv., m. 265°, 192[1].
$C_{24}H_{19}Hg_2NS_2$ Bis(phenylmercuri)amine, *p,p'*-bis(phenylmercapto)-, -*HCl*, 1605[7].
$C_{24}H_{19}NO$ Quinoline, 6 - methoxy - 2 - phenyl 4-styryl-, *and salts*, 2081[1,3].
$C_{24}H_{19}NO_2$ Acetophenone, α - (4 - methyl - 2 phenyl-6-quinolyloxy)-, 418[7].
Benzohydrol, 1 - naphthalenecarbamate, 1232[9].
Truxillimide, *N* - phenyl-, 1391[2].
$C_{24}H_{19}NO_3S$ Quinoline, 3 - (anisylsulfonyl)-2-styryl-, *and -HCl*, 419[2,3].
$C_{24}H_{19}N_3$ Triazene, 1,3 - bis(*p* - phenylphenyl)-, 587[4].
$C_{24}H_{19}N_5O_2$ Indigotin, 5 - *p* - (dimethylaminophenylazo)-, 2836[7].
$C_{24}H_{19}N_5O_6S_2$ Azo dye, m. 246–7°, from 4,6-dihydroxy - *m* - benzenedisulfonanilide, 2841[7].
$C_{24}H_{19}N_7$ Aniline, *p* - [*p* - (*p* - phenylazophenylazo)phenylazo]-, 2836[8].
$C_{24}H_{20}BrNO_3$ Bromo deriv., m. 251–3°, of the hydroxymonoacetyl compd., 192[1].
$C_{24}H_{20}ClN$ Addn. compd., m. 173–4°, of Ph_3CCl and C_5H_5N, 189[7].
1 - Methyl - 2,4,6 - triphenylpyridinium chloride, *and -HCl*, 1625[4].
$C_{24}H_{20}ClNO_2$ 4 - (*p* - Aminophenyl) - 2 - *p* - anisyl - 6 - phenylpyrylium chloride, -*HCl*, 758[4].
Monochloro deriv., m. 238°, 192[1].
$C_{24}H_{20}ClNO_3$ Propionic acid, (chlorobenzoyl)-hydroxyphenyl-, methyl ester, oxime, benzoate, 3168[5].
$C_{24}H_{20}Cl_6N_4OPt$ 5 - Acetamido - 12 - (*m* - aminophenyl) - 12 - α - benzophenazonium chloroplatinate, 602[4].
$C_{24}H_{20}HgN_6$ Triazene, 3,3' - mercuribis[1,3-diphenyl-, 591[2].
$C_{24}H_{20}MnNO_4$ 1 - Methyl - 2,4,6 - triphenylpyridinium permanganate, 1625[4].
$C_{24}H_{20}MoN_2O_{16}$ + H_2O Pyridine digallatomolybdate, 3405[9].
$C_{24}H_{21}N$ 4 - Pyridyl, 1,4 - dihydro - 1 - methyl-2,4,6 - triphenyl-, 1625[2].
$C_{24}H_{20}N_2$ Hydrazobenzene, *p,p'* - diphenyl-, 2848[2].
Ketone, benzyl naphthyl, phenylhydrazone, 1401[8].
$C_{24}H_{20}N_2O_2$ 2 - Acetonaphthone, 1 - hydroxy-, azine, 1617[4].
$C_{24}H_{20}N_2O_4$ Glycol, di - 1 - naphthalenecarbamate, 1232[9].
Truxillanilic acid, nitroso, 1392[8].
$C_{24}H_{20}N_2O_6S_2$ 1 - Naphthol - 4 - sulfonic acid, 2-acetyl, azine, 1617[4].
Succinic acid, α,β - bis(2 - naphthylsulfonamido), 2313[1].
$C_{24}H_{20}N_2O_{12}W$ + $3H_2O$ Pyridine digallatotungstate, 3405[9].
$C_{24}H_{20}N_4O_8$ Lepidine, ethoxy - 2 - phenyl, picrate, 418[6,7,8].
$C_{24}H_{20}N_4O_9$ 1,3 - Propanediol, 2 - (2 - phenyl 4-quinolyl)-, picrate, 2681[1].
$C_{24}H_{20}N_6O_{12}$ Propane, 2 - *p* - cumenyl - 1,3-dipicryl, 3000[4].
$C_{24}H_{20}O_2$ 1,2 - Ethanediol, 2 - (1 - naphthyl)-1,1-diphenyl-, 2851[9].
Naphthalene, 2,7 - bis(benzyloxy), 911[2].
$C_{24}H_{20}O_{14}U_2$ Uranium citrate, 3139[7].
$C_{24}H_{20}Si$ Silicane, tetraphenyl, 584[7].
$C_{24}H_{20}Sn$ Stannane, tetraphenyl, 584[7], 1607[8].
$C_{24}H_{21}BiCl_2O_6$ Bismuthine, tris(*p* - carboxyphenyl)-, dichloride, tri-Me ester, 1063[4].
$C_{24}H_{21}BrO_2$ 1 - Indanone, 3-(α - bromobenzyl)-2(or 3) - ethoxy - 2 - phenyl-, 1804[3].
$C_{24}H_{21}ClO_5$ Ethylmethyldiphenylbenzopyrylium perchlorate, 3167[8].
$C_{24}H_{21}N$ Quinaldine, α,α' - dibenzyl-, 419[8].
$C_{24}H_{21}NO$ Carbinol, triphenyl-, pyridine salt, -*HCl*, 189[8], 2490[8].
$C_{24}H_{21}NO_3$ Hydroxymonoacetyl compd., m. 196–8°, 191[8], 192[1].
$C_{24}H_{21}NO_3$ 1,2,6 - Oxazine, 5,6 - dimethoxy-3,4,6-triphenyl-, 1239[9].
Truxillanilic acid, *salts*, 1392[1].
$C_{24}H_{21}NO_4S_2$ Quinaldine, 3 - (anisylsulfonyl)-α-*p*-tolylsulfonyl-, 1625[2,3].
$C_{24}H_{21}NO_6S_2$ Quinaldine, α,3 - bis(*o* - anisylsulfonyl)-, 1625[9].
$C_{24}H_{21}N_3O_3$ Benzidine, *N* - (acetylisopropylidene) - *N'* - *p* - nitrobenzal-, 1614[8].
$C_{24}H_{21}N_3O_7$ Benzamide, *N* - [*o* - (β - hydroxyethyl)phenethyl] - *p* - nitro-, *p* - nitrobenzoate, 1413[8].
$C_{24}H_{21}N_3O_9S_3$ 1,3,5 - Benzenetrisulfonanilide, 2,4-dihydroxy-, 2841[7].
$C_{24}H_{21}N_3S_2$ 1 - Naphthoic acid, dithio-, diphenylguanidine salt, 3099[9].

$C_{24}H_{21}N_5O_9$ Carbamic acid, (β - 5 - acridylethyl)-, Et ester, picrate, 2501[7].

$C_{24}H_{22}As_2N_4O_4S_2$ Metanilanilide, 4′,4‴ - arsenobis-, 2838[8].

$C_{24}H_{22}ClN_2$ 4,4′ - Bipyridinium, 1,1′ - dibenzyl-, subchloride, 2163[9].

$C_{24}H_{22}Cl_2O_2$ Anthracene, 1,5 - dichloro - 9,10-diethoxy - 9,10 - dihydro - 9 - phenyl-, 2678[6].

$C_{24}H_{22}INO_3S$ 1 - Methyl - 3 - [o (and p) - phenetylsulfonyl] - 2 - phenylquinolinium iodide, 420[1,2].

$C_{24}H_{22}N_2$ Compd. from 3,4 - dihydro - 4 - methyl-3 - methylene - 5,6 - benzoquinoline and p - dimethylaminobenzaldehyde, 419[5].

$C_{24}H_{22}N_2O_2$ 1,3 - Butanedione, 1 - phenyl-, 3 - methylphenylhydrazone, Bz deriv. (?), 2856[8].

Δ[3] - 2 - Butenone, 4 - hydroxy - 4 - phenyl, methylphenylhydrazone, Bz deriv. (?), 2856[8].

Truxillamide, N - phenyl, 1391[4]

$C_{24}H_{22}N_4O_9$ 6 - Benzyloxy - 3,4 - dihydro - 7-methoxy - 2 - methylisoquinolinium picrate, 3011[3].

$C_{24}H_{22}N_4O_{11}$ Propiophenone, α - amino - 3,4-dimethoxy - β - (3,4 - methylenedioxyphenyl)-, picrate, 1083[8].

$C_{24}H_{22}O$ Δ[1] - 3 - Pentenone, 4 - benzyl - 1,5-diphenyl-, 419[5].

$C_{24}H_{22}O_2$ Benzopyran, methoxydimethyldiphenyl-, 3167[9].

Compds. from α - tolualdehyde, m 109°, 133° and 165°, 1400[9]

Compd. from α - tolualdehyde, m. 135°, 1401[1].

Valeric acid, β - benzyl - δ - hydroxy - α,γ-diphenyl-, δ-lactone, 1401[2].

m-Xylene, 4,6 - di - p - toluyl-, 386[1].

$C_{24}H_{22}O_4$ 1,1′ - Binaphthyl, 3,4,3′,4′ - tetramethoxy, 383[7].

m - Xylene, 4,6 - dianisoyl, 386[2].

$C_{24}H_{22}O_{11}$ Compd from quinone, 3695[4].

$C_{24}H_{23}N_3O_2$ Triazinedione, dihydrotriphenylpropyl-, 3169[1].

Urazole, 1,2 - bis(α - methylbenzyl) - 4-phenyl-, 1604[4].

$C_{24}H_{24}BaN_6O_{10}S_2$ 1,2,3 - Triazole - 4 - carboxylic acid, 1 - benzylsulfonyl - 5 - hydroxy, Et ester, Ba deriv., 1409[3].

$C_{24}H_{24}INO_2$ 6,7 - Bis(benzyloxy) - 3,4 - dihydro-2 - methylisoquinolinium iodide, 3011[2].

$C_{24}H_{24}N_2O_3$ Cyclohexanone, 2,6 - bis(p - acetamidobenzal), perchlorate, 2157[1].

$C_{24}H_{24}O_2$ Camphene, dibenzoyl, 4788[8].

$C_{24}H_{25}ClN_4O_{11}$ Ozocodeine, chlorodihydro-, picrate, 2165[4].

$C_{24}H_{25}NO_3$ Morphine, benzyl-, 2563[2]; - HCl, 969[2].

$C_{24}H_{25}NO_{12}$ 1 - Naphtholglucotetraacetate, 4-nitro-, 2487[2].

$C_{24}H_{25}N_3O_5$ 3,4 - Pyrazoledicarboxylic acid, 1-[p - (p - acetamidophenyl)phenyl] - 5-methyl-, di-Et ester, 599[2].

$C_{24}H_{26}CoN_4O_6S$ Butyric acid, β - sulfo-, Co deriv., pyridine salt, 1979[4].

$C_{24}H_{26}CuO_4$ 2,4 - Hexanedione, 6 - phenyl-, Cu deriv., 413[4].

$C_{24}H_{26}N_2O_2$ α - Toluamidine, N,N′ - di - p-phenetyl-, 1218[4].

$C_{24}H_{26}N_2O_5S_2$ 2 - Propanone, 1 - (o - phenetylsulfonyl) - 3 - p - tolylsulfonyl-, phenylhydrazone, 1625[8].

$C_{24}H_{26}N_4NiO_6S$ Butyric acid, β - sulfo-, Ni deriv., pyridine salt, 1979[4].

$C_{24}H_{26}N_4O_{12}$ Ozocodeine, dihydro-, picrate, 2165[4].

$C_{24}H_{26}O_2$ Propane, 2 - asaryl - 1,2 - diphenyl-, 2849[9].

$C_{24}H_{26}O_9S_3$ Glycerol, tri - p - toluenesulfonate, 740[2].

$C_{24}H_{27}ClN_4O_{11}$ 5 - Desoxymorphinic acid, chlorodihydro-, Me ester, picrate, 2165[9].

$C_{24}H_{27}NO_3$ ε - Truxillpiperididic acid, Me ester, 1391[6].

$C_{24}H_{27}NO_4$ Ecgonine, α - methylbenzyl ester, benzoate, P 2228[4]; phenethyl ester, benzoate, and - HCl and - H NO3, P 2228[4].

Pseudoecgonine, phenethyl ester, benzoate, P 2228[4].

$C_{24}H_{27}NO_5$ Ecgonine, benzyl ester, 2,3 - cresotate, P 2228[4].

$C_{24}H_{28}Cl_2N_2$ Piperidine, 1,1′ - (dichloro - 9,10-dihydro - 9,10 - anthrylene)bis-, 754[3], 3166[4].

$C_{24}H_{28}Cl_3IrN_4$, 2295[9].

$C_{24}H_{28}Cl_4O_4$ Diisoeugenol, tetrachlorodiethyl-, 748[3].

$C_{24}H_{28}Co_2N_6O_{18}$, 2296[4].

$C_{24}H_{28}HgI_4N_2$ Quinoline, complex salt with C_3H_7I and HgI_2, 3695[9].

$C_{24}H_{28}IN$ Tribenzylpropylammonium iodide, 2815[8].

$C_{24}H_{28}N_4O_{12}$ 5 - Desoxymorphinic acid, dihydro, Me ester, picrate, 2165[6].

$C_{24}H_{28}N_6O_5$ Acid, from β - diacetonefructose, phenylosazone, phenylhydrazine salt, 1389[1].

Galacturonic acid, phenylosazone, phenylhydrazine salt, 1389[5].

$C_{24}H_{28}N_{14}O_{10}$ Guanidine, α,α′ - ethylenebis, dipicrolonate, 3690[5].

$C_{24}H_{29}IN_2O_4$ Brucine, methiodide, 1795[8].

$C_{24}H_{29}NO_8$ Codeine, dihydrodihydroxy-, tri-Ac deriv., 2332[3].

$C_{24}H_{29}N_7O_7 + 3H_2O$ Brucinonic acid, hydrazide, semicarbazone, 1811[7].

$C_{24}H_{30}Hg_2N_6NaO_9$, 2719[6].

$C_{24}H_{30}N_2O_8$ Bicarbamic acid, N,N″ - p - biphenylenebis, tetra-Et ester, 410[6].

$C_{24}H_{30}O_4$ Compd. from hydrogenation of acenaphthenequinone, m. 206°, 1405[2].

$C_{24}H_{30}O_4S_2$ 2 - Butanone, bis(γ - hydroxypropyl)mercaptole, dibenzoate, 737[4].

$C_{24}H_{30}O_8$ Addn. compd., m. 147°, of 5,6,7,8-tetrahydro - 2 - naphthol and di-Me oxalate, 47[2].

$C_{24}H_{30}O_9$ 1,2 - Propanediol, 3 - (3,4 - dimethoxyphenyl) - 3 - (2,4,6 - trimethoxyphenyl)-, diacetate, 2489[8].

$C_{24}H_{31}Cl_{12}Ir_3K_9N_4$, 2295[9], 3659[7].

$C_{24}H_{31}NO_3$ Norcodeine, N - (cyclohexylmethyl), and - HCl, 3012[7].

$C_{24}H_{31}N_3O_3$ Cyclohexanecarboxylic acid, 2 - (p-dimethylaminophenyl) - 4 - hydroxy-6 - keto - 4 - methyl-, Et ester, phenylhydrazone, 173[3].

$C_{24}H_{32}Mo_{12}O_{64} + 9H_2O$ Citromolybdic acid, 3406[1].

$C_{24}H_{32}N_4O_9$ Isomaltose, osazone, 2829[5].

$C_{24}H_{32}N_8O_{36}$ α - Tetraamylose, octanitrate, 380[9].

$C_{24}H_{32}O_3$ Dianhydrogitoxigenin, 209[1].

$C_{24}H_{32}O_4$ Dianhydrobigitaligenin, acetyl-, 2724[6].

$C_{24}H_{32}O_5S_2$ d - Glucose dibenzyl mercaptal, mono-2 - butanone compd., 170[7].

$C_{24}H_{32}O_{16}$ Cellobiose anhydride, hexa-Ac deriv., 381[4].

$C_{24}H_{34}N_2O_2$ See *Eucupine*.

$C_{24}H_{34}O_5$ Dehydrocholic acid, 3039[7].

$C_{24}H_{34}O_8$ Bilianic acid, 401[3].
Isobilianic acid, 401[3].

$C_{24}H_{35}NO_9$ Stadenic acid, 13-ketonitro-, 2166[6].

$C_{24}H_{35}NO_{10}$ Dimethyl ester of acid from digitoic acid, m. 194–5°, 1414[3].

$C_{24}H_{36}O$ Cycloheptadecanone, benzal-, 1791[9].

$C_{24}H_{36}O_4$ Dehydrohyodesoxycholic acid, 2166[5].

$C_{24}H_{36}O_5$ Gitoxigenin, 208[9].

$C_{24}H_{36}O_6$ Bigitaligenin, acetyl deriv., 2724[5].
Lactonedicarboxylic acid, m. 226–7°, from 13-ketostadenic acid, and isomer, m 270°, 2166[7].
Lithobilienic acid, 2166[9].

$C_{24}H_{36}O_7$ Desoxybilianic acid, 400[3], 401[3].
Isodesoxybilianic acid, 401[3].
Stadenic acid, 13-keto-, 2166[6].

$C_{24}H_{36}O_9$ Ester of acid from oxydigitogenic acid, m. 142°, 1414[4].

$C_{24}H_{36}O_{10}$ Anthropo-choloidamic acid, 918[6].
Choloidanic acid, 400[3].

$C_{24}H_{36}O_{18}$ Cyclohexane, 1,2,3,4,5,6-hexacarboxyoxy-, hexa-Et ester, 2831[5].

$C_{24}H_{37}NO_{11}$ Trimethyl ester of acid from oxydigitogenic acid, m. 171°, 1414[4].

$C_{24}H_{38}O_5$ Pyroisolithobilianic acid, Me ester, 2166[8].

$C_{24}H_{38}O_6$ Allolithobilianic acid, 2166[9]
Isolithobilianic acid, 2166[7].

$C_{24}H_{38}O_7$ Lithobilianic acid, 12-hydroxy-, 2166[8].

$C_{24}H_{38}O_{13}S$ Glucose, diacetone-, sulfite, 1060[6]
Glucosesulfonic acid, diacetone-, diacetone glucose ester, 1060[6]

$C_{24}H_{40}Cl_4Fe_4O_{16}$, 2127[8]

$C_{24}H_{40}N_2$ Conessine, 3458[1]

$C_{24}H_{40}N_4O_4$ Compd., m. 228°, from 13-keto stadenic acid, 2166[7]

$C_{24}H_{40}O_2$ Allocholanic acid, 2167
Cholanic acid, 2167[1]. *Ag salt*, 409[1].
Desoxypyrolithobilianic acid, Me ester, 2167[1].

$C_{24}H_{40}O_3$ Isolithocholic acid, 916[4].

$C_{24}H_{40}O_4$ Allocholanic acid, 3,13-dihydroxy-, 2166[8].
Cheno-desoxycholic acid, 54[8,9].
Desoxycholic acid, 54[8,9], 401[5].
Hyodesoxycholic acid, 2166[5]

$C_{24}H_{40}O_5$ (See also *Cholic acid*.)
Acid from tobacco resins, 967[4]

$C_{24}H_{40}O_{20}$ Tetraglucosan, 743[3], 1598[7]

$C_{24}H_{41}NO$ Stearanilide, 309[8].

$C_{24}H_{42}CuO_4$ Δ[3]-2-Dodecenone, 4-hydroxy-, Cu deriv., 738[9].
3,5-Heptanedione, 4-β-methylbutyl-, Cu deriv., 413[7].

$C_{24}H_{42}O_4$ 1,1′-Bimenthol, diacetate, 1614[4]

$C_{24}H_{47}O_{20}S$ Sulfone, 1,1-dicellosyl, 379[8]

$C_{24}H_{48}O_2$ Lignoceric acid, 1590[8], 3582[9].
Palmitic acid, octyl ester, 2818[9].

$C_{24}H_{57}Cl_{18}Ir_2N_{11}$, 2295[8], 3659[7].

$C_{24}H_{64}Cl_6Co_2N_{20}O_{24}$ + $6H_2O$, 1962[1].

$C_{24}H_{64}Cl_{12}Co_2N_{20}O_{12}S_3$ + $10H_2O$, 1961[9]

$C_{24}H_{64}Co_2I_6N_{20}$, 1961[8].

$C_{24}H_{64}Co_2N_{20}O_{18}S_3$ + $8H_2O$, 1961[9].

$C_{24}H_{64}Co_2N_{20}O_{24}S_{18}$ + $18H_2O$, 1962[1].

$C_{24}H_{64}Co_2N_{26}O_{24}$ + $4H_2O$, 1962[1].

$C_{25}H_{13}Cl_3N_4O_7$ 1,5,10-Trichloro-9-anthrylpyridinium picrate, 755[5].

$C_{25}H_{14}N_2O_{12}$ Triacetate of dinitro deriv. from oxidation of atromentin, 400[3].

$C_{25}H_{14}O_3$ Δ[2,2′]-Biindan-1,3,1′-trione, 2′-benzal-, 911[7].

$C_{25}H_{16}Cl_2N$ 5-Acridyl, 1(and 3)-chloro-10-(chlorophenyl)-5,10-dihydro-5-phenyl-, 1992[3,4].

$C_{25}H_{16}Cl_3N$ Acridan, 1,5(and 3,5)-dichloro-10-(chlorophenyl)-5-phenyl-, 1992[3,4].

$C_{25}H_{18}O$ Indone, 2-phenyl-3-o-tolyl-, 1407[6].

$C_{25}H_{16}O_4$ Δ[2,2′]-Biindan-1,3,1′-trione, 2′-α-hydroxybenzyl-, 911[7].

$C_{25}H_{17}Br_3O$ Ether, 2,4,6-tribromophenyl triphenylmethyl, 1233[1]

$C_{25}H_{17}ClIN$ Acridan, 5-(p-chlorophenyl)-5-iodo-10-phenyl-, 1991[9]

$C_{25}H_{17}ClN$ 5-Acridyl, 3-chloro-5,10-dihydro-5,10-diphenyl-, 1992[2].
—, 5-(chlorophenyl)-5,10-dihydro-10-phenyl-, 1991[6], 1992[1]

$C_{25}H_{17}Cl_2N$ Acridan, chloro(chlorophenyl)phenyl-, 1991[9], 1992[1,3,4]
—, 2,5(and 3,5)-dichloro-5,10-diphenyl-, 1992[7].

$C_{25}H_{17}Cl_2NO$ 5-Acridanol, 1(and 3)-chloro-10-(chlorophenyl)-5-phenyl-, 1992[3]

$C_{25}H_{18}Br_4O_7S$ m-Cresolsulfonephthalein, tetrabromo-, diacetate, 3001[4]

$C_{25}H_{18}ClN$ Acridan, 2-chloro-5,10-diphenyl-, 1992[5].

$C_{25}H_{18}ClNO$ 5-Acridanol, 2(and 3)-chloro-5,10-diphenyl-, 1992[7]
—, 5-(chlorophenyl)-10-phenyl-, 1991[8,9], 1992[1].

$C_{25}H_{18}N_2O$ 3(5)-Acridone, amino-5,5-diphenyl-, 1801[7], 1802[2]

$C_{25}H_{18}N_4O_4$ Acridan, 1-amino-3,7-dinitro-5,5-diphenyl-, 1802[6].

$C_{25}H_{18}N_4O_{10}$ 4-Quinolineacrylic acid, 6-methoxy-2-phenyl-, picrate, 1413[8]

$C_{25}H_{18}O_6$ Chromone, 7,8-dihydroxy-2,3-diphenyl-, diacetate, 197[3]
Coumarin, dihydroxy-3,4-diphenyl-, diacetate, 595[4].

$C_{25}H_{19}NO_3$ Benzoin, 1-naphthalenecarbamate, 1232[9].

$C_{25}H_{19}NO_8S$ Sulfongallein, aniline salt, 2491[4].

$C_{25}H_{19}N_3$ Neuslamine, α-N-benzyl-4′-phenylazo-, 587[2].

$C_{25}H_{19}N_3O$ 3(5)-Acridone, diamino-5,5-diphenyl-, 1801[6], 1802[3].

$C_{25}H_{19}N_3O_4$ Acridan, 1,9-diamino-3,7-dinitro-5,5-diphenyl-, 1802[4].

$C_{25}H_{20}ClNO_2$ 4-(p-Acetamidophenyl)-2,6-diphenylpyrylium chloride, *ZnCl₂ compd.*, 758[6]

$C_{25}H_{20}N_2O_2S$ Carbanilide, p,p′-diphenoxythio-, 1603[8]

$C_{25}H_{20}N_2O_4$ 1,2,6-Isoxdiazine, 2-benzoyl-5-(2,5-cresyl)-3-methyl-, benzoate, 1412[8].

$C_{25}H_{20}N_4O$ 3(5)-Acridone, 1,7,9-triamino-5,5-diphenyl-, 1801[8].

$C_{25}H_{20}N_4O_8$ Quinoline, 6-methoxy-2-phenyl-4-propenyl-, picrate, 2681[7].

$C_{25}H_{20}N_4O_9$ Quinaldine, 4-methoxy-α-(o-methoxybenzal)-, picrate, 1626[3].

$C_{25}H_{20}N_4O_{11}$ Isoquinoline, 6,7-methylenedioxy-3-veratryl-, picrate, 1084[1].

$C_{25}H_{22}N_4O_{12}$ 3-Isoquinolinecarbinol, α-(3,4-dimethoxyphenyl)-6,7-methylenedioxy-, picrate, 1084[1].

$C_{25}H_{20}O$ Acetophenone, p-methyl-α-1-naphthyl-α-phenyl-, 410[6].

$C_{25}H_{20}OS$ Sulfoxide, phenyl triphenylmethyl, 2060[8].
$C_{25}H_{20}O_3$ 1-Acrylonaphthone, β-(4-ethoxy-1-naphthyl)-2 hydroxy-, 2159[2].
4,1 - β - Naphthopyrone, 3 (4-ethoxy-1-naphthyl) 2,3 dihydro-, 2159[1].
$C_{25}H_{21}ClO_3$ 2 - (p - Hydroxystyryl)-7 methoxy-3 - methyl - 1 - phenylbenzopyrylium chloride, 3454[9].
$C_{25}H_{21}ClO_7$ 2 - (p - Hydroxystyryl)-7-methoxy-3-methyl - 4 phenylbenzopyrylium perchlorate, 3154[9]
$C_{25}H_{21}NO_5$ 1,4 - Pyran - 4 - ol, . 4-(p acetamidophenyl) - 2,6 - diphenyl , and perchlorate, 758[2].
$C_{25}H_{21}N_3$ Biphenyl, p, p'' - methylazimino-bis (?), 2848[4]
$C_{25}H_{22}BrNO_4$ 4 - (p Aminophenyl)-2,6 di-p-anisylpyrylium bromide, 758[4].
$C_{25}H_{22}ClNO_3$ 4 (p - Aminophenyl)-2,6 di p anisylpyrylium chloride, - HCl, 758[3]
$C_{25}H_{22}N_2O_4$ 1,3 - Propanediol, di 1-naphthalenecarbamate, 1232[9]
$C_{25}H_{22}N_4$ Aniline, p, p' (p phenylazobenzal)-bis , 2836[7]
$C_{25}H_{22}N_4O$ Phenol, p [-(p, p'-diaminobenzohydryl)phenylazo] , 2836[7]
$C_{25}H_{22}N_4O_4$ 1,4 - Piperazinedicarboxanilide, 3 benzyl 2,5 diketo , 915[8]
$C_{25}H_{22}N_4O_8$ Quinoline, 1 methoxy 2 (methoxyphenethyl) , picrate, 1626[9]
$C_{25}H_{22}N_4O_8$ 1,3 Propanediol, 2 (6-methoxy-2 phenyl 4 quinolyl) picrate, 2681[1]
$C_{25}H_{22}N_4O_{12}$ Ketone, 3,4 dimethoxyphenyl 1,2,3,4 - tetrahydro - 6,7 - methylenedioxy 3 isoquinolyl, picrate, 1083[9].
$C_{25}H_{22}N_4S$ Carbanilide, p, p' bis(p-aminophenylthio-, 752[2], 1393[2].
$C_{25}H_{22}N_6O$ + H_2O 3:5 Acridone, 1,7,9 triamino 5,5-bis(aminophenyl)-, 1801[9]
$C_{25}H_{22}O$ 1 - Naphthaleneëthanol, α-methyl α, β diphenyl , 110[8]
$C_{25}H_{22}O_3$ Methane, (2,4 dimethoxyphenyl)-1-naphthylphenyl , 2849[8]
$C_{25}H_{22}O_7S$ m Cresolsulfonephthalein, diacetate, 3001[9].
$C_{25}H_{23}ClO_5$ Methyldiphenylpropylbenzopyrylium perchlorate, 3167[9].
$C_{25}H_{23}NO_2$ Methoxy deriv., m 164-6°, of mono Ac compd , 191[6], 192[1].
$C_{25}H_{23}NO_3$ Truxillamlic acid, Me ester, 1392[1]. N-methyl , 2664[7], β-Truxinamlic acid, N-methyl , 2665[1].
$C_{25}H_{23}NO_4S$ 1 - Methyl 2,4,6 - triphenylpyridinium methosulfate, 1084[9]
$C_{25}H_{23}NO_4S_2$ Quinaldine, 3 [o(and p) phenetyl sulfonyl] - α - p - tolylsulfonyl , 1625[8, 9].
$C_{25}H_{23}NO_6$ Hydroxylamine, β, β-bis(β-hydroxyethyl)-, tribenzoate, 361[2]
$C_{25}H_{24}IN$ α, α - Dibenzyl-1-methylquinaldinium iodide, 419[8].
$C_{25}H_{24}N_2$ Compd. from 4 ethyl-3,4-dihydro-3-methylene- 5,6 - benzoquinoline and p-dimethylaminobenzaldehyde, 419[5]
$C_{25}H_{25}BrN_2O_4$ 3 - Chromanone, 4-(3,4-dimethoxyphenyl) - 5,7 - dimethoxy-, p bromo phenylhydrazone, 2489[4].
$C_{25}H_{25}Cl_2NO$ Benzamide, N, N bis[m-(chloromethyl)phenethyl]-, 391[8].
$C_{25}H_{25}FO_5$ d-Glucosyl fluoride, 6-triphenylmethyl-, 1221[7].
$C_{25}H_{25}IN_2$ 5,6 - Benzoquinoline, 3 (p-dimethylaminostyryl)-, ethiodide, 419[6].
$C_{25}H_{25}N_3O_2$ Triazinedione, ethyldihydrophenylditolyl-, 3169[1].
$C_{25}H_{25}N_3O_3$ Benzamide, p-nitro-N-o-(1,2,3,4-tetrahydro - 2 - isoquinolylmethyl)phenethyl-, 418[2].
$C_{25}H_{26}N_2O$ Isoquinoline, 2-o-(salicylalaminoethyl)benzyl-, 418[2].
$C_{25}H_{26}N_2O_2$ Carbamic acid, tri-p-tolylmethylimino-, Et ester, 408[8].
Dye, acetate, from N, N, N', N' - tetramethyl - 9 - phenyl - 3,6 - fluorenediamine, 2837[1].
3 - Isofluorene, 3-(acetoxydihydrodimethylimino) - 6 - (dimethylamino) - 9 - phenyl , 2837[2].
$C_{25}H_{26}N_2O_3$ Nitrone, α-[β-(N-hydroxyanilino)-isobutyl] - α - methyl-N-phenyl-(?), benzoate, 2837[4].
2 - Pentanone, 4-(N-hydroxyanilino)-4-methyl-, cyclic N-phenyloxime (?), benzoate, 2837[4].
$C_{25}H_{26}N_2O_3S$ Quinine, 2-thenoyl-, and chloroplatinate, 2854[8].
$C_{25}H_{27}NO_4$ Δ[3] - Cyclohexenecarboxylic acid, 6 - (p - dimethylaminophenyl)-4-(o-hydroxystyryl)-2-keto-, Et ester, 173[1].
$C_{25}H_{27}N_3O_3$ Holocaine, N-phenylcarbamyl-, 1218[5]
Nitrone, α [β - (N-hydroxyanilino)isobutyl]-α-methyl - N - phenyl-(?), PhNCS condensation product, 2837[7].
2-Pentanone, 4 - (N-hydroxyanilino)-4-methyl-, cyclic N-phenyloxime (?), PhNCS condensation product, 2837[7].
$C_{25}H_{28}N_2O_2$ Carbazic acid, β-tri-p-tolylmethyl-, Et ester, 408[8].
$C_{25}H_{28}O_3$ Thebaine deriv., 766[1].
$C_{25}H_{29}AsN_4O_5$ Hydrocupreine, 5'-p-arsonophenylazo , 1467[3]
$C_{25}H_{29}NO_3$ ε - Truxillpiperididic acid, Et ester, 1391[6].
$C_{25}H_{29}NO_5$ Ecgonine, benzyl ester, tropate, P 2228[4]
$C_{25}H_{30}$ Pentacyclopentadiene, 2148[6].
$C_{25}H_{30}ClN_3$ See Crystal violet.
$C_{25}H_{30}N_2O_7S$ + $3H_2O$ Butyric acid, β-sulfo-, acid strychnine salt, 2482[4].
$C_{25}H_{30}N_4O_8$ 2,7 - Fluorenedibicarbamic acid, tetra-Et ester, 410[6].
$C_{25}H_{30}N_4O_{12}$ 5-Desoxymorphinic acid, dihydro-, Et ester, picrate, 2165[7].
$C_{25}H_{30}N_{14}O_{10}$ Guanidine, α-methyl-α, α'-ethylenebis , dipicrolonate, 3159[1].
Vitiatine, dipicrolonate, 3159[1].
$C_{25}H_{30}O_{11}S_2$ Glucose, 3-acetyl-5,6 di-p-toluenesulfonylmonoacetone-, 2985[5].
$C_{25}H_{31}Cl_{14}N_{12}O_6Sn_4$, 156[8].
$C_{25}H_{32}O_4$ Malonic acid, bis(γ-phenylpropyl)-, di-Et ester, 911[1].
$C_{25}H_{33}NO_3$ Norcodeine, N-(cycloheptylmethyl)-, 3012[7].
$C_{25}H_{33}NO_{10}$ Oxonitine, 765[4]
$C_{25}H_{35}NO_{16}$ Glucoarabononitrile, heptaacetyl-, 2988[5].
$C_{25}H_{34}N_2O_4$ α-Toluic acid, N, N'-heptamethylenebis[α - amino , di-Me ester, 371[2].
$C_{25}H_{34}O_{17}$ d-Gluco-d arabinose, heptaacetyl-, 2988[4].
$C_{25}H_{38}O_4$ Dehydrohyodesoxycholic acid, Me ester, 2166[5].
$C_{25}H_{38}O_5$ Dianhydrostrophanthidin, octahydro-, acetate, 208[6].

$C_{25}H_{40}AsI$ Benzyltricyclohexylarsonium iodide, 2839[6].
$C_{25}H_{40}Br_2IN$ Quinoline, complex salt with $C_{16}H_{33}I.Br_2$, 3695[9].
$C_{25}H_{40}HgI_3N$ Quinoline, complex salt with $C_{16}H_{33}I$ and HgI_2, 3695[8].
$C_{25}H_{40}IN$ Quinoline, complex salt with $C_{16}H_{33}I$, 3695[7].
$C_{25}H_{40}I_3N$ Quinoline, complex salt with $C_{16}H_{33}I.I_2$, 3695[8]
$C_{25}H_{40}O_2$ Pyrostadenic acid, Et ester, 2166[8].
$C_{25}H_{40}O_5$ Dimethyl ester, m. 99°, of acid from 13-hydroxylithobilianic acid, 2167[1].
$(C_{25}H_{42})_x$ Hydropolycyclo-rubber, 3589[3].
$C_{25}H_{42}O_3$ Isolithocholic acid, Me ester, 916[4]
$C_{25}H_{42}O_4$ Allocholanic acid, 3,13-dihydroxy-, Me ester, 2166[4].
$C_{25}H_{52}$ Tachardiacerin, 2390[7].
$C_{25}H_{52}O$ Tachardiacerol, 2390[6]
$C_{25}H_{80}Cu_3N_{21}O_6$, 3401[2].
$C_{26}H_{14}Br_2S_4$ Spiro[1,3-benzodisulfole-2,9'-(10')-phenanthrene-10',2''-1,3-benzodisulfole] 5(or 6),5''(or 6'') dibromo-, 1797[9].
$C_{26}H_{14}N_4O$ o-Diphenoylene 2,3 phenazino iminazole, 1805[6].
$C_{26}H_{16}$ $\Delta^{9,9'}$-Bifluorene, 2455[4].
$C_{26}H_{16}Cl_4OS_2$ Acetophenone, α,α bis(2,5-dichlorophenylmercapto)-α-phenyl-, 3289[6].
$C_{26}H_{16}N_8O_9$ Stilbene, α (2,4 dinitrophenylazo)-α' (2,4 dinitrophenylazoxy) (?), 2849[3].
$C_{26}H_{16}O_4$ Spiro[indan-2,2'(3')-naphthalene-3',2''-indan]-1,3,1'',3''-tetrone, 1',4'-dihydro-, 185[8].
$C_{26}H_{17}ClN_4O_4$ m-Phenylenediamine, 5-chloro-N,N'-di-2-naphthyl 2,4-dinitro-, 1222[7].
$C_{26}H_{17}Cl_2N$ 9-Anthramine, 1,5 dichloro N,10 diphenyl-, 2678[9].
$C_{26}H_{18}$ Anthracene, 9,10 diphenyl-, 3003[6]
$C_{26}H_{18}As_2N_2O_{10}Sb_2$ p-Arsenophenol, 3,3' bis(2,3,4-trihydroxybenzalamino)-di antimonyl deriv., 1987[4].
$C_{26}H_{18}BrNO_4S_2$ Quinaldine, 3-(p bromophenylsulfonyl)-α-(2 naphthylsulfonyl)-, 1626[1].
$C_{26}H_{18}Br_2N_2O_2$ o,m' Bianiline, 5,6'-dibromo-N,N'-disalicylal-, 1614[8]
$C_{26}H_{18}Br_4$ Anthracene, 1,2,3,4 tetrabromo-1,2,3,4-tetrahydro 9,10-diphenyl-, 3003[8].
$C_{26}H_{18}Br_4O_2$ Benzopinacol, 4,4',4'',4'''-tetrabromo-, 1736[7].
$C_{26}H_{18}Cl_2N_2$ 9,10-Anthradiamine, 1,5 dichloro-N,N'-diphenyl-, 755[4].
$C_{26}H_{18}Cl_4O_4$ Phthalide, 3,4,5,6-tetrachloro 2-(2,3-cresyl)-2-(4,3-cresyl)-, diacetate, 1231[8].
$C_{26}H_{18}CuO_4$ 1-Acrylonaphthone, β-hydroxy-, Cu deriv., 1590[8].
$C_{26}H_{18}MgO_6$ Xanthone, 1 hydroxy-, Mg deriv., 399[8].
$C_{26}H_{18}N_2O_2$ 1,10-Anthracenedione, 4,9-dianilino-, 2853[7]
$C_{26}H_{18}N_4$ αγ-Dibenzophenazine, 11 amino-12 anilino-, 590[8].
$C_{26}H_{18}N_4O_7$ Benzoquinoline, methylphenyl-, picrate, 418[8].
$C_{26}H_{18}OS_4$ 1,3-Benzodisulfole, 2,2'-oxybis[2-phenyl-, 3290[1]
$C_{26}H_{18}O_2$ 3,3'-Spirobi[4,3-β-naphthopyran], 2-methyl-, 3008[4].
$C_{26}H_{18}O_3$ 9(10)-Phenanthrone, 10,10-bis(p-hydroxyphenyl)-, 412[6].
—, 10,10-diphenoxy-, 412[3].
$C_{26}H_{18}O_4$ 1,9-Benzodi-1,4-pyran-4,6-dione, 3,7-dimethyl-2,8-diphenyl-, 1624[9].
$C_{26}H_{18}O_6$ Muconic acid, β,γ-dihydroxy-α,δ-diphenyl-, γ-lactone, Me ester, benzoate, 2849[7].
$C_{26}H_{19}BrN_2O$ Benzamide, p-bromo-N-triphenylmethylimino-, 408[6].
$C_{26}H_{19}ClN_2$ Quinoline red, 2329[4].
$C_{26}H_{19}ClN_4$ Flavinduline, 11,12-diamino-, chloride, 590[9].
$C_{26}H_{19}ClN_4O_4$ Flavinduline, 11,12 diamino-, perchlorate, 590[9].
$C_{26}H_{19}ClO_6$ 3-[(2-hydroxy-1-naphthyl)-vinyl]-2-methyl-β-naphthopyrylium perchlorate, 3008[4].
$C_{26}H_{19}NO_3$ Benzanilide, p' (p-hydroxyphenyl)-, benzoate, 1073[5]
$C_{26}H_{19}N_3O$ 5,6 Benzoquinoxaline, 6 acetamido 2,3 diphenyl-, 602[8].
$C_{26}H_{19}N_3O_3$ Benzidine, N-p nitrobenzal-N' salicylal-, 1614[9]
$C_{26}H_{19}N_5O_3$ Flavinduline, 11,12-diamino-, nitrate, 590[9]
$C_{26}H_{20}As_2Cl_4N_2$ Phenarsazine, 1-chloro 1,6 dihydro-, s tetrachloroethane addn. compd., 1608[8].
$C_{26}H_{20}As_2N_2O_8$ p Arsenophenol, 3,3'-bis(2,3,4 trihydroxybenzalamino)-, 1987[2]
$C_{26}H_{20}BrN$ 1-(10-Benzyl-9 anthryl)pyridinium bromide, 3452[9].
$C_{26}H_{20}Br_4N_6$ Hydrazine, s-dibenzoyl-, bis(2,4 dibromophenylhydrazone), 1085[4].
$C_{26}N_{20}Br_4N_4S_2$ Benzothiazole, 1-anilino-, tribromide, 195[1]
$C_{26}H_{20}Br_8N_4S$ 1,2,4-Thiodiazole, tetrahydro 2,4 diphenyl-3,5-bis(phenylimino)-, octabromide, 1806[7].
$C_{26}H_{20}ClNO$ Acridan, 5-(p chlorophenyl)-5-methoxy 10 phenyl-, 1991[9]
$C_{26}H_{20}Cl_2N_2$ 9,10-Anthradiamine, dichloro 9,10 dihydro N,N'-diphenyl-, 754[5], 3166[8]
$C_{26}H_{20}CuN_2O_2$ o Cresol, α-(phenylimino)-, Cu deriv., 399[8].
$C_{26}H_{20}I_6N_4S$ 1,2,4 Thiodiazole, tetrahydro 2,4 diphenyl 3,5 bis(phenylimino)-, hexaiodide, 1806[7].
$C_{26}H_{20}N_2O$ Benzamide, N triphenylmethylimino-, 408[6].
$C_{26}H_{20}N_2O_2$ m,m'-Bianiline, N,N'-disalicylal-, 1614[8].
$C_{26}H_{20}N_2O_3$ Benzanilide, oxybis-, 392[3,4].
$C_{26}H_{20}N_8O_{12}$ Toluene, 2,4,6-trinitro-, addn. compd with Ph_2N_2, 1062[8].
$C_{26}H_{20}O_6$ Chrysin, 3-benzyl-, diacetate, 197[1].
Flavone, 3 benzyl-7,8-dihydroxy-, diacetate, 197[3]
$C_{26}H_{20}O_8$ 1,1,2-Ethanetriol, 1,2-bis(2,4-dihydroxyphenyl)-2-phenyl-, anhydride, triacetate, 2324[7].
$C_{26}H_{21}BrN_2O$ Benzoic acid, p-bromo-, triphenylmethylhydrazide, 408[6].
$C_{26}H_{21}Cl$ Methane, chlorodiphenyl(p-tolylphenyl)-, 1988[9].
$C_{26}H_{21}ClN_4$ 6,7-Diamino-1,2,3-triphenyl quinoxalinium chloride, 591[1]
$C_{26}H_{21}ClN_4O_4$ 6,7-Diamino-1,2,3-triphenylquinoxalinium perchlorate, 591[1].
$C_{26}H_{23}ClN_4O_6$ 5-Acetamido-12-(m-acetamidophenyl)-12-α-benzophenazonium perchlorate, 602[8].

$C_{26}H_{21}NO_3S$ Quinoline, 3-(anisylsulfonyl)-2-(γ-benzalpropenyl)-, 419[2,3].
$C_{26}H_{21}N_3O$ Xenylamine, N-anisal-4'-phenylazo-, 587[2].
$C_{26}H_{22}$ Methane, diphenyl(p-tolylphenyl)-, 1988[2].
$C_{26}H_{22}As_2N_4O_4$ Benzanilide, arsenobis[3-aminohydroxy-, 394[9], 2318[6].
$C_{26}H_{22}As_2N_4O_6$ Benzanilide, arsenobis[3-aminodihydroxy-, 2318[6,7].
$C_{26}H_{22}Br_2N_2$ 9,10-Anthrylenedimethylenebispyridinium bromide, 3004[1].
$C_{26}H_{22}ClNO_4$ Propionic acid, (chlorobenzoyl)hydroxyphenyl-, methyl ester, oxime, acetate benzoate, 3168[6].
$C_{26}H_{22}ClNO_7$ 4-(p-Acetamidophenyl)-2-p-anisyl-6-phenylpyrylium perchlorate, 758[4].
$C_{26}H_{22}Cl_2N_4O_2$ Di Meldola's blue, 2837[1].
$C_{26}H_{22}CuN_4S_2$ Formic acid, phenylazothiol phenylhydrazone, Cu deriv., 1223[9].
$C_{26}H_{22}N_2O$ Benzoic acid, triphenylmethylhydrazide, 408[3].
$C_{26}H_{22}N_4$ Phenazine, 2-(p-dimethylaminophenylazo)-5,7-dihydro-7-imino-5-phenyl-, 2836[5].
Safranine-2-azodimethylaniline, 2836[7].
$C_{26}H_{22}N_4PbS_2$ Formic acid, phenylazothiol, phenylhydrazone, Pb deriv., 1223[9].
$C_{26}H_{22}O$ Carbinol, diphenyl(p-tolylphenyl)-, 1988[2].
Compd., b₁₂ 275°, m. 58-9°, from 2-benzyl-1-(1-naphthyl)-3-phenyl-1,2-propanediol, 2852[1].
$C_{26}H_{22}O_2$ Benzopinacol, 2999[9], 3000[1].
$C_{26}H_{22}O_4$ Addn. compd., m. 106°, of di-Ph oxalate and PhOH, 47[2].
$C_{26}H_{23}ClO_3$ 7-Methoxy-2-(p-methoxystyryl)-3-methyl-4-phenylbenzopyrylium chloride, and $FeCl_3$ compd., 3454[9].
$C_{26}H_{23}ClO_4$ 4-p-Anisyl-2-(p-hydroxystyryl)-7-methoxy-3-methylbenzopyrylium chloride, and $FeCl_3$ compd., 3455[1].
2-(4-Hydroxy-3-methoxystyryl)-7-methoxy-3-methyl-4-phenylbenzopyrylium chloride, and $FeCl_3$ compd., 3454[9].
$C_{26}H_{23}NO$ Isobutyramide, N-1(and 2)-naphthyl-β,β'-diphenyl-, 3452[1].
$C_{26}H_{23}NO_3$ 3-Piperidinecarbinol, α-1,4-trimethyl-, benzoate, -HCl, 1809[6].
$C_{26}H_{23}NO_4$ Di Ac compd., m. 155-7°, 191[4], 192[1].
$C_{26}H_{23}NO_6$ Isoquinoline, 2-benzoyl-1,2,3,4-tetrahydro-6,7-methylenedioxy-3-veratroyl-, 1083[9].
$C_{26}H_{23}N_7$ Aniline, N,N-dimethyl-p-[p-(p-phenylazophenylazo)phenylazo]-, 2836[8].
$C_{26}H_{24}B_2N_2O_{14}$ Anthrarufin, 4,8-diacetamido-, diboroacetate, 1052[6].
$C_{26}H_{24}Cl_6N_8Pt$ Bis(4-amino-1,2-diphenyl-1,2,3,5-tetrazolium) chloroplatinate, 1224[1].
$C_{26}H_{24}Cr_2N_8O_7$ Bis(4-amino-1,2-diphenyl-1,2,3,5-tetrazolium) dichromate, and di-HCl, 1224[1].
$C_{26}H_{24}N_2O_2$ 2-Propionaphthone, 1-hydroxy, azine, 1617[9].
$C_{26}H_{24}N_2O_4$ Compd. from 3-acetyl-2,6-dimethylchromone dioxime, m. 184-4.5°, 1411[9].
Dianhydro-6-aminopiperonaldihydrohydroxycodeinone, 765[9].
$C_{26}H_{24}N_2O_8S_2$ 1-Naphthol-4-sulfonic acid, 2-propionyl-, azine, 1617[9].
$C_{26}H_{24}N_4$ 1,2-Cyclopentanedione, 3-methyl-, bis(2-naphthylhydrazone), 2484[6].
$C_{26}H_{24}N_4O_2$ Aniline salt, m. 173°, of compd. from $ClCH_2CO_2H$ and KCN, 2996[4].
$C_{26}H_{24}N_4O_{11}$ Dicentrine, picrate, 206[2].
Paraberine, 7,12,12₁,13-tetrahydro-2,3-dimethoxy-9,10-methylenedioxy-, picrate, 1084[3].
$C_{26}H_{24}O_2$ 1,2-Propanediol, 2-benzyl-1-(1-naphthyl)-3-phenyl-, 2851[9].
$C_{26}H_{25}NO_2$ Ethoxy deriv., m. 125-7°, of mono-Ac compd., 191[4], 192[1].
$C_{26}H_{25}N_5O_{11}$ Isoquinoline, 1,2,3,4-tetrahydro-2-methyl-6,7-methylenedioxy-1-(6-nitroveratryl)-, picrate, 206[2].
$C_{26}H_{26}As_2N_4O_4S_2$ Toluenesulfonanilide, arsenobis[amino-, 2838[7], 3746[9].
$C_{26}H_{26}CuO_8$ Benzoic acid, m-(β-acetyl-γ-hydroxy-Δ²-butenyl)-, Cu deriv., and Cu salt, 2843[3].
$C_{26}H_{26}FeN_4O_{10}$ Pyruvic acid, (methylphenylcarbamyl)nitroso-, Et ester, Fe salt, 2823[2].
$C_{26}H_{26}IN$ α,α-Dibenzyl-1-ethylquinaldinium iodide, 119[6].
$C_{26}H_{26}N_2O_6S_2$ Proline, 1-(N-phenylsulfonyltyrosyl)-, benzenesulfonate, 3169[9].
$C_{26}H_{26}N_4O_{11}$ Isoquinoline, 1,2,3,4-tetrahydro-2-methyl-6,7-methylenedioxy-1-veratryl-, picrate, 206[1].
$C_{26}H_{26}O_2$ Benzopyran, isopropylmethoxymethyldiphenyl-, 3167[9].
$C_{26}H_{26}O_6$ Xylene, diveratroyl-, 386[1,2].
$C_{26}H_{27}IN_2$ Carbocyanine, 1,1'-diethyl-6-methyl-, iodide, 419[7].
$C_{26}H_{28}N_2O_3$ Niquine, benzoate, and HCl, 1993[9].
$C_{26}H_{28}N_4O_{13}$ Ozocodeine, dihydro-, acetate, picrate, 2165[5].
$C_{26}H_{29}BrN_4O$ 1 Propanone, 3-(3-ethylidene-4-piperidyl)-1-(6-methoxy-4-quinolyl)-, p-bromophenylhydrazone, 1993[8].
$C_{26}H_{29}NO_4$ Δ³-Cyclohexenecarboxylic acid, 6-o-anisyl-4-(p-dimethylaminostyryl)-2-keto-, Et ester, 173[2].
—, 6-(p-dimethylaminophenyl)-2-keto-4-(o-methoxystyryl)-, Et ester, 173[2].
$C_{26}H_{29}NO_5$ Δ³-Cyclohexenecarboxylic acid, 6-(p-dimethylaminophenyl)-4-[2-hydroxy-3(and 5)-methoxystyryl]-2-keto-, Et ester, 173[3,4].
$C_{26}H_{29}N_3O_3$ Propionamidine, N,N'-di-p-phenetyl-N-phenylcarbamyl-, 1218[6].
$C_{26}H_{29}N_3O_7$ Succinic acid, α-[p-acetamidophenyl)phenylazo]-α,β-diacetyl-, di-Et ester, 599[2].
$C_{26}H_{30}CuO_4$ 2,4-Hexanedione, 3-benzyl-, Cu deriv., 413[1].
$C_{26}H_{30}N_2O_7$ Pyruvic acid, brucine salt, 3059[3].
$C_{26}H_{30}N_4O_8$ Dibenzylamine, m,m'-bis(ethoxymethyl)-, picrate, 391[8].
$C_{26}H_{31}AsN_4O_6$ Hydrocupreine, 8'-p-arsonophenylazo-5'-hydroxy-, 6'-methyl ether, 1467[2].
$C_{26}H_{31}N_3O_5$ + $3H_2O$ Brucinonic acid, Et ester, semicarbazone, 1811[1].
$C_{26}H_{32}HgI_4N_2$ Quinoline, complex salt with C_4HgI and HgI_2, 3695[9].
$C_{26}H_{33}N_3O_9$ o-Acetaniside, 4-[β-hydroxy-4,5-dimethoxy-2-(β-N-methylacetamidoethyl)phenethyl]-3-nitro-(?), acetate, 3458[2].
$C_{26}H_{35}ClO_{17}$ Celtrobiose, chloro-, heptaacetate, 2484[1].
Neolactose, α-chloro-, heptaacetate, 2484[1].

$C_{26}H_{36}O_2$ Truxilldiol, tetraethyl-, 1391[7].
$C_{26}H_{38}O_4$ Diketone, m. 228°, from crude digitogenin, 605[4].
Lupulone, 744[5].
$C_{26}H_{38}O_7$ Bigitaligenin, diacetyl deriv., 2724[5].
$C_{26}H_{38}O_8$ Acid from an acid from the prepn. of digitogenic acid, m. 273–4°, 1414[5].
$C_{26}H_{38}O_{17}Se$ Selenoxide, 6,6-di(methylglucosyl), hexaacetate, 379[8].
$C_{26}H_{38}O_{18}S$ Sulfone, 6,6-di(methylglucosyl), hexaacetate, 379[8].
$C_{26}H_{40}O_3$ Monoketone, m. 204–5°, from crude digitogenin, 605[4].
$C_{26}H_{40}O_6$ Dimethyl ester, m. 148°, of acid from 13-ketostadenic acid, 2166[7].
$C_{26}H_{42}O_{11}$ Cellobioside, β-benzylheptamethyl-, 380[6].
$C_{26}H_{43}NO_6$ Glycocholic acid, *Na salt*, 1452[5], 1741[9].
$C_{26}H_{44}Cu_2N_8O_8$, 2466[2]
$C_{26}H_{44}O_3$ Isolithocholic acid, Et ester, 916[4].
$C_{26}H_{45}NO_7S$ Taurocholic acid, *Na salt*, 1452[5].
$C_{26}H_{48}Br_2N_4NiO_8S_2$ Triaminotriethylamine-nickelous *d*-bromocamphorsulfonate, 1589[4].
$C_{26}H_{52}O_2$ Acid from montan wax, *Tl salt*, 2818[2]
Cerotic acid, *Tl salt*, 2818[2].
Hexacosanoic acid, 1590[9], 3582[9].
Stearic acid, octyl ester, 2818[9].
Tachardiaceric acid, 2390[7].
$C_{27}H_{12}Cl_4O_6$ Fluoran, 12,13,14,15-tetrachloro-3-hydroxy-, benzoate, 3001[4]
$C_{27}H_{12}Cl_4O_7$ Fluoran, 12,13,14,15-tetrachloro-3,4-dihydroxy-, monobenzoate, 3001[7]
$C_{27}H_{12}O_3$ Truxone, 911[8]
$C_{27}H_{15}BiI_3N_3O_{12}S$ 5-Quinolinesulfonic acid, 8-hydroxy-7-iodo-, bismuth deriv., *Na salt*, 796[4]
$C_{27}H_{17}ClO_2$ 9-Fluorenecarboxylic acid, 9-chloro-, 9-fluoryl ester, 2675[8]
$C_{27}H_{18}N_2O$ 9(10)-Cyclopentabenzoquinoxalinone, 8,10-diphenyl-, 207[7]
$C_{27}H_{18}N_2O_4S$ 5-Cyclopentabenzoquinoxalinesulfonic acid, 9,10-dihydro-9-keto-8,10-diphenyl-, 207[7]
$C_{27}H_{18}N_2O_5S$ 3-Cyclopentabenzoquinoxalinesulfonic acid, 9,10-dihydro-1-hydroxy-9-keto-8,10-diphenyl-, 207[7]
$C_{27}H_{18}O$ Ketone, phenyl 10-phenyl-9-anthryl, 3453[2].
$C_{27}H_{18}O_2$ 2(1)-Naphthalenone, 1,1'-benzenylbis-, 1803[5]
—, 1-(1,2-dihydro-2-keto-α-phenyl-1-naphthal)-, 2877[4].
$C_{27}H_{19}ClO$ Triphenylbenzopyrylium chloride, *FeCl₃ compd. and HCl compd.*, 3167[3,4]
$C_{27}H_{19}ClO_5$ Triphenylbenzopyrylium perchlorate, 3167[3]
$C_{27}H_{19}Cl_3O_2S_2$ Acetophenone, α-(5-chloro-anisylmercapto)-α-(2,5-dichlorophenyl)-α-phenyl-, 3289[6]
$C_{27}H_{19}NO_2$ 2(1)-Naphthalenone, 1-(1,2-dihydro-2-keto-α-phenyl-1-naphthal)-, oxime, 2877[4]
$C_{27}H_{20}N_2$ 2,7-Fluorenediamine, N,N'-dibenzal-, 410[7].
$C_{27}H_{20}N_2O$ Compd., m. 184°, from 1,1'-benzenylbis-2(1)-naphthalenone and $N_2H_4 \cdot H_2O$, 1803[6]
$C_{27}H_{20}N_2O_2$ 3(5)-Acridone, acetamido-5,5-diphenyl-, 1801[7]
2,7-Fluorenediamine, N,N'-dibenzoyl-, 410[7].
$C_{27}H_{20}N_4O_3$ Semicarbazide, 1,2-dibenzoyl-1-phenyl-4-phenylimino-, 1223[9].
$C_{27}H_{20}O$ Ketone, 9,10-dihydro-10-phenyl-9-anthryl phenyl, 3453[2].
Benzopyran, triphenyl-, 3167[2].
$C_{27}H_{20}O_2$ Benzopyranol, triphenyl-, 3167[3].
2-Naphthol, 1,1'-benzalbis-, 1803[5].
$C_{27}H_{20}O_6$ Muconic acid, β,γ-dihydroxy-α,δ-diphenyl-, γ-lactone, Me ester, α-toluate, 2849[7].
$C_{27}H_{20}O_{12}S$ Sulfonegallein, tetraacetate, 2491[4].
$C_{27}H_{21}NO_3$ Toluhydroxamic acid, α,α-diphenyl-, benzoate, *and salts*, 591[6,7].
$C_{27}H_{21}N_5O_9$ 1-[β-(1,3-Dihydro-1-hydroxy-3-keto-1-phenyl-2-isoindyl)ethyl]pyridinium picrate, 1408[2].
$C_{27}H_{22}ClNO$ Acridan, 5-(p-chlorophenyl)-5-ethoxy-10-phenyl-, 1991[9].
$C_{27}H_{22}N_2O$ p-Toluamide, N-triphenylmethylimino-, 408[6].
$C_{27}H_{22}N_2O_2$ 9-Fluorenecarbamic acid, 9-fluorylamine salt, 2670[1]
$C_{27}H_{22}N_4S$ Benzophenone, thiocarbohydrazone, 1811[1]
$C_{27}H_{22}O$ 2-Propanone, 1,1,3,3-tetraphenyl-, 3000[5]
$C_{27}H_{22}O_2$ Chromanol, triphenyl-, 3167[3].
$C_{27}H_{23}FO_8$ Glucosyl fluoride, 2,3,5-tribenzoyl-, 1221[6]
$C_{27}H_{24}As_2Cl_2N_2O$ Phenarsazine, 1-chloro-1,6-dihydro-, acetone addn. compd., 1606[6]
$C_{27}H_{24}As_2N_4O_{11}$ Carbanilide, m,m'-bis(5-arsono-2-hydroxyphenylcarbamyl)-, 970[5].
$C_{27}H_{24}ClNO_8$ 4-(p-Acetamidophenyl)-2,6-di-p-anisylpyrylium perchlorate, 758[6]
$C_{27}H_{24}N_2O$ p-Toluic acid, triphenylmethylhydrazide, 408[6].
$C_{27}H_{24}N_8O_{14}$ Ethylenediamine, N-benzyl-N'-phenyl-, dipicrate, 1624[7]
$C_{27}H_{24}O$ Ether, diphenyl(p-tolylphenyl)methyl methyl, 1988[4]
1,2-Propanediol, 1,1,3,3-tetraphenyl-, 3000[5].
$C_{27}H_{24}O_3S_3$ Phloroglucinol, 2,4,6-tris(p-tolylmercapto)-, 3289[6]
$C_{27}H_{24}O_6$ 1,2,3-Cyclohexanetriol, tribenzoate, 1061[3]
$C_{27}H_{25}ClO_4$ 4-p-Anisyl-7-methoxy-2-(p-methoxystyryl)-3-methylbenzopyrylium chloride, *and FeCl₃ compd.*, 3455[1].
$C_{27}H_{25}Cl_4FeO_4$ 4-p-Anisyl-7-methoxy-2-(p-methoxystyryl)-3-methylbenzopyrylium chloride, FeCl₃ compd., 3455[1].
$C_{27}H_{26}AsClN_2O_2$ Compd. from dehydroquinine and AsCl₃, 1630[6].
$C_{27}H_{26}ClNO_2$ 2-(p-Dimethylaminostyryl)-7-methoxy-3-methyl-4-phenylbenzopyrylium chloride, *and FeCl₃ compd.*, 3454[6].
$C_{27}H_{26}ClNO_6$ 2-(p-Dimethylaminostyryl)-7-methoxy-3-methyl-4-phenylbenzopyrylium perchlorate, *and perchlorate*, 3454[5].
$C_{27}H_{26}Cl_4FeNO_2$ 2-(p-Dimethylaminostyryl)-7-methoxy-3-methyl-4-phenylbenzopyrylium chloride, FeCl₃ compd., 3454[6].
$C_{27}H_{27}NO_2$ Dibenzamide, N-(2-benzylcyclohexyl)-, 2665[7].
$C_{27}H_{28}N_6$ Aniline, p,p'-[p-(p-dimethylaminophenylazo)benzal]bis-, 2836[1].
$C_{27}H_{28}AsCl_4N_2O_2$ Compd. from dehydroquinine and AsCl₃, 1629[9].

$C_{27}H_{24}N_4O_{10}$ Norcodeine, N-(cyclopropylmethyl)-, picrate, 3012[7].
$C_{27}H_{28}Na_2O_5S$ Thymolsulfonephthalein, di-Na deriv., 1615[4].
$C_{27}H_{28}O_4S_2$ Benzaldehyde, bis(γ-hydroxypropyl) mercaptal, dibenzoate, 737[4].
$C_{27}H_{29}NaO_5S$ Thymolsulfonephthalein, Na deriv., 1615[4].
$C_{27}H_{30}N_2O_5$ Quinine salicylate, 1030[2].
$C_{27}H_{30}N_4O_6$ Compd. from the hydrazide, phenylhydrazone of brucinonic acid, m. 260°, 1811[4].
$C_{27}H_{30}N_6O_2$ Compd., decomps. 167-9°, from methyl 2,4-dimethyl-3-pyrryl ketone, pyridine, and BrCN, 1621[3].
$C_{27}H_{30}O_5S$ Benzoic acid, o-sulfo-, dithymyl ester, 1615[2].
Thymolsulfonephthalein, 1615[2].
$C_{27}H_{30}O_{15}$ Apiin, 1991.
$C_{27}H_{30}O_{16}$ + $2H_2O$ Rutin, 1991.
$C_{27}H_{31}ClN_2O_9$ Malic acid, β-chloro-, brucine salt, 366[6].
$C_{27}H_{31}NO_4$ Benzoic acid, 2-o-anisyl-4-(p-dimethylaminostyryl)-2,3-dihydro-6-methoxy-, Et ester, 173[2].
$C_{27}H_{31}N_3O_3$ Butyramidine, N,N'-di-p-phenetyl-N'-phenylcarbamyl-, 1218[6].
$C_{27}H_{32}AsNO_3S$ Benzoic acid, p-(ethylmethylarsyl)-, As-sulfide, morphine salt, 363[9].
$C_{27}H_{32}N_2O_3$ Δ^3-Cyclohexenecarboxylic acid, 6-(p-dimethylaminophenyl)-4-(p-dimethylaminostyryl)-2-keto-, Et ester, 173[3].
$C_{27}H_{32}Br_4Cl_4N_4O_6Sn_2$, 156[8]
$C_{27}H_{33}NO_5S$ Thymolsulfonephthalein, NH_4 deriv., 1615[4]
$C_{27}H_{33}NO_6S$ Morphimethine, α-methyl-, Me p-toluenesulfonate addn. compd., 1797[6].
$C_{27}H_{34}BrN_3O_6$ 3-Pyrrolecarboxylic acid, 5,5'-(3-bromo-5-carboxy-4-methyl-2-pyrrylmethylene)bis[2,4-dimethyl-, tri-Et ester, 2160[5]
$C_{27}H_{34}N_2O_8S$ + $4H_2O$ Butyric acid, β-sulfo-, acid brucine salt, 2482[4]
$C_{27}H_{34}HgI_2N_2$ Quinoline, complex salt with PrI and HgI_2, 3695[8]
$C_{27}H_{36}O_4$ Compd., m. 208°, from α-scymnol, 401[9].
$C_{27}H_{38}O_4$ Methyl ester of acid from the prepn. of digitogenic acid, m. 201°, 1411
$C_{27}H_{40}N_4O_7$ See 1 a.ine
$C_{27}H_{40}N_4O_{10}$ Talose, ?,?'-methylenebis[α-methyl-α-phenylhydrazone], 904[9]
$C_{27}H_{41}NO_8$ Stadenic acid, 13-ketonitro-, tri-Me ester, 2166[8]
$C_{27}H_{42}Cl_2N_2O_2$ See 1 a.ine.
$C_{27}H_{42}O_6$ Lithobilienic acid, tri-Me ester, 2166[9].
$C_{27}H_{42}O_7$ Allolithobilianic acid, keto-, tri-Me ester, 2167[1].
Lithobilianic acid, keto-, tri-Me ester, 2167[1]
Stadenic acid, 13-keto-, tri-Me ester, 2166[8]
$C_{27}H_{43}IO_4$ Dicarboxylic acid from iodocholesterol, 3299[6].
$C_{27}H_{44}O_6$ Allolithobilianic acid, tri-Me ester, 2166[6].
Isolithobilianic acid, tri-Me ester, 2166[7].
$C_{27}H_{44}O_7$ Lithobilianic acid, 13-hydroxy-, tri-Me ester, 2166[8].
$C_{27}H_{44}O_8$ Acid, m. 120°, from chloromercuricholesterol, 3299[8].
$C_{27}H_{45}ClHgO$ Cholesterol, (chloromercuri)-, 3299[6].
$C_{27}H_{45}IO$ Cholesterol, iodo-, 3299[6].
$C_{27}H_{46}O$ (See also Cholesterol.)
Compd., m. 133-4°, from cholesterol, 1242[3].
Sterol, 3099[9], 3100[2,3].
$C_{27}H_{46}O_6$ Tetrahydroxymonocarboxylic acid, m. 172-3°, from chloromercuricholesterol, 3299[7].
$C_{27}H_{46}O_{23}$ Hexopentosan, 3310[6].
$C_{27}H_{48}O$ Coprosterol, 2167[1].
$C_{27}H_{48}O_6$ α-Scymnol, 401[8].
$C_{27}H_{48}O_9$ Caprylic acid, η-formyl-, trimer, 1590[2].
$C_{27}H_{50}O_6$ Palmitin, β-mono-, α,γ-dibutyryl-, 2818[7].
$C_{27}H_{54}O_2$ Acid, Tl salt, m. 146°, 2818[2].
Cerotic acid, 220[7]
$C_{27}H_{56}$ Heptacosane, 3444[6].
$C_{27}H_{56}O$ Ceryl alcohol, 3411[1].
14-Heptacosanol, 2819[2].
$C_{28}H_{12}N_2O_2$ Flavanthrene, P 1996[1]
$C_{28}H_{12}Cl_2N_2O_4$ 9,9'-Bianthryl, dichlorodinitro-, 1078[2].
$C_{28}H_{12}Cl_4O_2$ 10,10'-Bianthrone, 4,5,4',5'-tetrachloro-, 2492[1]
$C_{28}H_{14}N_2O_4$ Indanthrene, P 1813[9]
$C_{28}H_{16}Br_2O_2$ Peroxide, bis(10-bromo-9-phenanthryl), 112.
$C_{28}H_{16}Cl_2N_4$ Nicotinonitrile, 2,4-dichloro-6-nitrile, dimer, 915[2]
$C_{28}H_{16}N_2$ Phenanthrazine, 112[1]
$C_{28}H_{16}N_2O_2S_2$ Phthalimide, p,p'-dithiobis[N-phenyl-, 600[4]
$C_{28}H_{16}O_4$ $\Delta^{2,2'}$-Biindan-1,3,1'-trione, 2'-(1,3-diketo-2-indanylmethyl)-, 911[5]
$C_{28}H_{16}Br_2$ $\Delta^{9,9',10,10'}$-Bianthracene, dibromo-(?), 1078[2].
9,9'-Bianthryl, dibromo-9,10-dihydro-(?), 1078[2]
$C_{28}H_{16}ClN_5$ 2,13-Diphenyl-2-benzotriazolophenaz-13-onium chloride, 2859[9].
$C_{28}H_{16}Cl_2$ $\Delta^{9,9',10,10'}$-Bianthracene, dichloro-(?), 1078[2]
9,9'-Bianthryl, dichloro-9,10-dihydro-(?), 1078[2]
$C_{28}H_{16}Li_2O_8$ Quinizarin, di-Li deriv., salicylaldehyde addn. compd., 741[5]
$C_{28}H_{16}N_2O_2$ Indicotin, 1,1-diphenyl-, $FeCl_3$ compd., 414[5].
$C_{28}H_{16}N_6O_3$ 2,13-Diphenyl-2-benzotriazolophenaz-13-onium nitrate, 2859[9]
$C_{28}H_{18}O$ 9-Anthryl ether, 192[6].
$C_{28}H_{18}O_2$ Anthracene, 9,10-dibenzoyl-, 2852[6].
$C_{28}H_{18}O_4$ Naphtholphthalein, 2870[2]
$C_{28}H_{18}S_2$ 9-Anthryl disulfide, 192[5]
$C_{28}H_{18}S_4$ 9-Anthryl tetrasulfide, 192[5].
$C_{28}H_{19}NO_2$ $\Delta^{9,9',10,10'}$-Bianthracene, nitro-(?), 1078[2].
9,9'-Bianthryl, 9,10-dihydro-?-nitro-(?), 1078
$C_{28}H_{19}N_3$ Quinoline, 2,2',2''-methenyltris-, $HgCl_2$ compd., 2330[1].
Rosinduline, phenyl-, 1992[7]
$C_{28}H_{19}N_5O$ 2,13-Diphenyl-2-benzotriazolophenaz-13-onium hydroxide, 2860[1].
$C_{28}H_{20}$ $\Delta^{9,9',10,10'}$-Bianthracene (?), 1078[2].
9,9'-Bianthryl, 9,10-dihydro-(?), 1078[2].
$C_{28}H_{20}BrNO_2$ 1,4-Oxazin-5(6)-one, 4-bromo-3,4,6,6-tetraphenyl-, 1239[9]
$C_{28}H_{20}ClNO_2$ 1,4-Oxazin-5(6)-one, 4-chloro-3,4,6,6-tetraphenyl-, 1239[9].
$C_{28}H_{20}N_2$ Succinonitrile, tetraphenyl-, 1402[6].
$C_{28}H_{20}N_2O_4$ 1,4-Oxazin-5(6)-one, 4-nitro-3,4,6,6-tetraphenyl-, 1239[9].
$C_{28}H_{20}N_4O_2S$ 1,2,4-Triazol-3(2)-one, 1,2

dibenzoyl - 4 - phenyl - 5 - phenylimino-3-thio-, 2162[3].
$C_{28}H_{20}N_4O_6S_4$ Benzothiazolesulfonic acid, 1,1'-*p*,*p* - azodiphenylbis[4-methyl-, 2327[5].
$C_{28}H_{20}O$ 1 - Acetonaphthone, α-1-naphthyl-α-phenyl-, 410[5].
Benzopyran, benzaldiphenyl-, 3167[7].
Furan, tetraphenyl-, 327[1].
Ketone, 10-benzyl-9-anthryl phenyl, 3453[1].
$C_{28}H_{20}O_2$ Anthracene, 9,10-dibenzoyl-9,10-dihydro-, 3293[2].
3(2) - Furanone, 2,2,4,5-tetraphenyl-, 391[1].
$C_{28}H_{21}ClO$ Benzyldiphenylpyrylium chloride, *FeCl₃ compd.*, 3167[8].
$C_{28}H_{21}ClO_4$ Benzyldiphenylpyrylium perchlorate, 3167[8].
Methyltriphenylbenzopyrylium perchlorate, 3167[9].
$C_{28}H_{21}Cl_2N$ Aniline, *p*-(1,5-dichloro-10-phenyl-9-anthryl)-*N*,*N*-dimethyl , 2678[3].
$C_{28}H_{21}NO_2$ 5 - Isoxazolecarbinol, α,α-3,4-tetraphenyl-, 391[1].
1,2,6 - Oxazin-5-ol, 3,4,6,6-tetraphenyl-, 1239[9].
$C_{28}H_{22}Cl_2N_2$ 9,10 - Anthradiamine, 1,5-dichloro-*N*,*N'* - dimethyl - *N*,*N'* - diphenyl-, 755[4].
$C_{28}H_{22}N_2O_2$ 1,10 - Anthracenedione, 4,9-di *p* toluino-, 2853[7].
Anthraquinone, 1,4-di-*p*-toluino , 2853[6]
$C_{28}H_{22}N_4OS$ Δ[2] - 1,2,4 Triazoline, 1 benzoyl-3 - (benzylmercapto) - 4 - phenyl 5-phenylimino-, 2162[3].
$C_{28}H_{22}N_4O_2$ Diphenic acid, bis(benzalhydrazide), 2672[5].
$C_{28}H_{22}N_4O_4S_2$ Oxanilide, *o*,*o''*-dithiobis , 600[1].
$C_{28}H_{22}O$ Benzopyran, benzyldiphenyl , 3167[8].
Ketone, 10 benzyl 9,10 dihydro-9-anthryl phenyl, 3453[2].
$C_{28}H_{22}O_2$ Benzopyran, methoxytriphenyl , 3167[3].
Benzopyranol, methyltriphenyl-, 3167[9]
9,9'(10,10')-Bi 9 anthrol, 2853[1].
9,9'-Bixanthyl, 9,9'-dimethyl-, 2328[1]
Compd , m 226–7°, from 1,1' - benzenylbis-2(1)-naphthalenone, and MeMgI, 1803[6]
Fluorene, 9 - (di-*p*-anisylmethylene)-, 365[2].
$C_{28}H_{22}O_3$ 9(10)-Phenanthrone, 10,10 dicresyl-, 412[4].
$C_{28}H_{22}O_8$ 1,1' - Bi[naphthalene]-3,4,3',4'-tetrol, tetraacetate, 383[8].
$C_{28}H_{23}NO$ Compd. from 2 (β-bromoethyl) 3 - hydroxy - 3 - phenylphthalimidine and PhMgBr, m. 172°, 1408[3].
$C_{28}H_{23}NO_2$ Δ[2] - 5 - Isoxazolinecarbinol, 5-hydroxy α,α-3,4 tetraphenyl-, 390[9].
$C_{28}H_{24}Cl_2N_2$ 9,10 Anthradiamine, dichloro 9,10-dihydro - *N*,*N'* - dimethyl *N*,*N'*-diphenyl , 754[4], 3166[2].
$C_{28}H_{24}N_2O_6Sn$ + $2H_2O$ Pyridine tripyrocatecholatostannate, 3404[1].
$C_{28}H_{24}N_2O_9Sn$ + $2H_2O$ Pyridine tripyrogallolstannate, 3404[2].
$C_{28}H_{24}O_2$ 1-Propanol, 2,2,3-triphenyl-, benzoate, 2850[1].
$C_{28}H_{25}BrO_8$ Glucoside, methyl-, bromohydrin, tribenzoate, 376[1], 1221[4].
$C_{28}H_{25}N$ Diindanylamine, *N*-2-naphthyl-, 756[2].
$C_{28}H_{25}NO$ Acetophenone, *p* dimethylamino-α-triphenyl-, 408[7].
$C_{28}H_{25}NO_2$ 1-Propanol, 2,2,3-triphenyl-, carbanilate, 2850[1].
$C_{28}H_{24}N_2$ Compd., m. 190–2°, from the phenylhydrazone of 2-benzyl-1-indanone and $PhNHNH_2$, 191[4,9].
Monophthalyl deriv., m. 256–8°, 192[2].
$C_{28}H_{27}N_3O$ Benzamide, *p*-dimethylamino-*N*-triphenylmethylimino-, 408[7].
$C_{28}H_{27}N_3O_{15}$ 4' - β - Glucosidoxy-7-hydroxy-3-methoxyflavylium picrate, 3297[4].
$C_{28}H_{28}N_8O_{12}$ Toluene, 2,4,6-trinitro-, addn. compd. with *N*,*N*-dimethyl - *p* - phenylazoaniline, 1062[8].
$C_{28}H_{26}As_2N_4O_6$ Anisanilide, 3',3'''-arsenobis[3-amino-6'-hydroxy-, 2318[7].
$C_{28}H_{26}N_2O_{10}W$, 3405[9].
$C_{28}H_{26}N_2O_{10}S$ Norcodeine, *N*-(2-thienylmethyl)-, picrate, 3012[7].
$C_{28}H_{26}N_6$ Azobenzene, *m*,*m'*-bis(*p*-tolylazo)-, 2836[3].
$C_{28}H_{26}O$ Ethanol, 1,2-dibenzyl-1,2-diphenyl-, 2325[2]
Ether, diphenyl(*p* - tolylphenyl)methyl ethyl, 1988[3]
$C_{28}H_{26}O_2$ 10,10' - Bi - 9 - anthrol, 1,2,3,4,-1',2',3',4' octahydro , 1403[9].
$C_{28}H_{26}O_2S_3$ Orcinol, 2,4,6-tris(*p*-tolylmercapto)-, 3289[7].
$C_{28}H_{26}O_8$ Isorhamnoside, tribenzoyl α-methyl-, 1221[6].
$C_{28}H_{28}O_{13}$ Alizarin, glucoside, tetraacetate, 2679[3]
Chrysazin, glucoside, tetraacetate, 2679[4].
$C_{28}H_{28}O_{14}$ Purpurin, glucoside, tetraacetate, 2679[4].
$C_{28}H_{28}S$ Compd. from Me benzylxanthate, m. 184–5°, 1395[9].
$C_{28}H_{27}NO_3$ Dibenzylamine, *m*,*m'*-bis(phenoxymethyl)-, 391[7].
1,2 Ethanediol, 1 - *p* - (dimethylaminophenyl)-1,2,2-triphenyl-, 187[8].
$C_{28}H_{27}N_3O$ Benzoic acid, *p*-dimethylamino-, triphenylmethylhydrazide, 408[7].
$C_{28}H_{27}N_7OS$ Lauth's violet 2,7-bisazodimethylaniline, 2836[7]
$C_{28}H_{28}ClNO_3$ 4 - *p* - Anisyl - 2 - (*p*-dimethylaminostyryl) - 7 - methoxy - 3 - methylbenzopyrylium chloride, *and FeCl₃ compd.*, 3455[1].
$C_{28}H_{28}N_4$ Xenylamine, 4',4'''-azobis[*N*,*N*-dimethyl-, *and HCl*, 587[1].
$C_{28}H_{28}O_4Si$ *p* Tolyl orthosilicate, 1605[8].
$C_{28}H_{28}O_4$ Methane, asaryl(2,4-dimethoxyphenyl)-1-naphthyl-, 2849[9].
$C_{28}H_{28}Pb$ Plumbane, diphenyldi - 2,5 - xylyl-, 2669[1].
$C_{28}H_{29}N_3O_4$ Anthroxanic acid, quinine salt, 180[1].
$C_{28}H_{29}N_5O_2$ 9 - γ - Isobenzophenoxazine, 9-(diethyldihydrohydroxyimino) - 5 - (*p*-dimethylaminophenylazo)-, 2836[7].
Nile blue - 2 - azodimethylaniline, 2836[7].
$C_{28}H_{30}O$ Compd., m. 106°, from cyclohexenylacetophenone and EtONa, 3447[9].
$C_{28}H_{31}NO$ Benzanilide, 2'-benzyl-*ar'*-hexahydro-*N*-phenethyl-, 2665[9].
$C_{28}H_{31}NO_7S$ *N* - Methylpapaverinium *p*-toluenesulfonate, 1798[9].
$C_{28}H_{32}N_2$ Compd., m. 152°, from *p*-toluquinaldine and *p*,*p'*-bis(dimethylamino)benzohydrol, 1627[7].
$C_{28}H_{32}N_6O_{11}$ *o*-Acetanisidide, 3-amino-4-[(1,2,3,4-tetrahydro - 6,7 - dimethoxy - 2 - methyl-1 - isoquinolyl)methyl]-, picrate, 3450[9].
$C_{28}H_{32}O_2$ Compd., m. 201°, from cyclohexenylacetophenone and NaOEt, 3447[4].

$C_{28}H_{32}O_{11}$ + $4H_2O$ Acaciin, 2162[4].

$C_{28}H_{33}N_3O_3$ Valeramidine, *N*, *N'*-di-*p*-phenetyl *N*-phenylcarbamyl-, 1218[5].

$C_{28}H_{34}N_2O_2$ Truxillic acid, dipiperidide, 1391[6].

$C_{28}H_{34}O_2$ 10,10'-Bi-9-anthrol, 1,2,3,4,5,6,7,8,1',2',3',5',6',7',8' - hexadecahydro-, 1403[3].

$C_{28}H_{34}O_4$ β-Truxinic acid, monomenthyl ester, 2664[6].

$C_{28}H_{35}BrN_2O_6$ Isovaleric acid, α-bromo-, brucine salt, 2310[4].

$C_{28}H_{35}Fe_2N_4O_{14}S$ + H_2O, 2127[8].

$C_{28}H_{36}N_2O_6$ 2,4 - Pyrroledicarboxylic acid, 5 - [bis(4 - acetyl-3,5-dimethyl 2-pyrryl)-methyl]-3 methyl-, di-Et ester, 2160[4].

$C_{28}H_{36}HgI_4N_2$ Quinoline, complex salt with C_4H_9I and HgI_2, 3695[9]

$C_{28}H_{36}N_2O_6Sn$ + $2H_2O$ Piperidine tripyrocatecholatostannate, 3404[3].

$C_{28}H_{36}N_4O_7$ Apoconessine, picrate, 3458[5].

$C_{28}H_{37}NO_{18}$ Cellobiononitrile, octaacetyl-, 2988[3].

$C_{28}H_{38}N_8O_{14}S$ Piperidine, γ,γ'-thiobis[1-propyl-, dipicrate, 362[9].

$C_{28}H_{38}O_{19}$ Cellobiose, octaacetyl-, 380[1]
Isomaltose, octaacetate, 2829[1]
Neolactose, octaacetate, 2184[1,2]

$C_{28}H_{38}O_{20}S$ Sulfone, 1,1-digalactosyl, octaacetate, 379[6].
—, 1,1-diglucosyl, octaacetate, 379[6].

$C_{28}H_{39}NO_{19}$ Cellobiose, octaacetyl-, antioxime 2988[4]

$C_{28}H_{40}N_2O_4$ See *Cephaeline*.

$C_{28}H_{40}N_4O_4$ Piperazine, 1,4-bis(ε-benzamidoamyl)-, and di *HCl*, 2862[6]

$C_{28}H_{44}O_9$ + H_2O Dimethyl ester of acid from the prepn. of digitogenic acid, m. 125°, 1414[3]

$C_{28}H_{42}Fe_2N_7O_{29}S_2$ + $2H_2O$, 2127[8]

$C_{28}H_{42}N_2O_2$ Piperazine, 1,4-bis(3-camphorylidenemethyl)-2,5-dimethyl-, 2682

$C_{28}H_{42}O_4$ Cyclopentanecarbinol, 1,2,2,3-tetramethyl-, phthalate, 1398[4]

$C_{28}H_{43}NO_2$ Aniline, *N*, *N*-bis[β-keto-β-(1,2,2,3-tetramethylcyclopentyl)ethyl]-, 1399[1]

$C_{28}H_{44}O_6$ Hyodesoxycholic acid, diacetate, 2186[5].

$C_{28}H_{46}$ Compd. from shark liver oil, 6 *HCl*, 576[7].

$C_{28}H_{46}Br_2O_8S_4$ Ethylenebis[ethylmethylsulfonium *d*-bromo-π-sulfonate], 1217[5].

$C_{28}H_{50}CuO_4$ Δ[3] 2-Tetradecenone, 4-hydroxy-, Cu deriv., 738[9]

$C_{28}H_{48}O_8S_4$ Ethylenebis[ethylmethylsulfonium *d*-camphorsulfonate], 1217[5].

$C_{28}H_{54}O_6$ 1,2,4-Tetracosanedicarboxylic acid, 12,13-dihydroxy-, di Me ester, 1599[1].

$C_{28}H_{54}O_{11}$ Cellobiose, octaethyl-, 380[5].

$C_{29}H_{15}Cl_2NO_4$ 2-Anthraquinonecarboxamide, 1-chloro-*N*-(1-chloro-2-anthraquinonyl)-, 1628[2].

$C_{29}H_{16}ClNO_4$ 2-Anthraquinonecarboxamide, *N*-anthraquinonyl-1-chloro-, 1628[1]

$C_{29}H_{17}ClN_2O_4$ 2-Anthraquinonecarboxamide, 1-amino-*N*-(1-chloro-2-anthraquinonyl)-, 1628[1].

$C_{29}H_{18}N_2O_4$ 2-Anthraquinonecarboxamide, 1-amino-*N*-1(and 2)-anthraquinonyl-, 1628[1].

$C_{29}H_{18}N_6S$ Phenanthrotriazole, 2,2'-thiocarbonylbis-, 1810[9].

$C_{29}H_{18}N_4O_2S$ Phenanthrenequinone, 9,9'-thiocarbohydrazone, 1810[9].

$C_{29}H_{19}N_5O_{10}$ 1,2-Pyran-2-ol, 2(and 4)-(*m*-nitrophenyl)-4,6(and 2,6)-diphenyl-, picrate, 417[2,3].

$C_{29}H_{19}N_3O_4$ *s*-Triazine, 2,4-bis(4-hydroxynaphthyl)-6-(dihydroxyphenyl)-, P 510[8].

$C_{29}H_{19}N_5O_9$ Pyridine, 2(and 4)-(*m*-nitrophenyl)-4,6(and 2,6)-diphenyl-, picrate, 417[2,3].

$C_{29}H_{20}N_4O_7$ Quinoline, 2-phenyl-4-styryl-, picrate, 2681[2].

$C_{29}H_{20}N_4O_8$ 4-(Aminophenyl)-2,6-diphenylpyrylium picrate, 417[4], 758[2].

$C_{29}H_{20}O$ Cyclopentadienone, tetraphenyl-, 383[8], 1407[8].

$C_{29}H_{20}O_4$ Flavone, 3-benzyl-7-hydroxy-, benzoate, 197[1].
9-Fluorenecarboxylic acid, 9-hydroxy-, 9-fluoryl ester, acetate, 2675[7]

$C_{29}H_{21}N_3$ Methane, (1-methyl-2(1)-quinolylidene)di-2-quinolyl-, 2329[6].

$C_{29}H_{21}N_3O_4$ 1-Naphthylamine, *N*(α,α-diphenyl-*o*-tolyl)-2,4-dinitro-, 1801[9].

$C_{29}H_{21}N_5O_8$ 2,4-Bis(*p*-aminophenyl)-6-phenylpyrylium picrate, 758[4].

$C_{29}H_{22}$ 1,2,4-Pentatriene, 1,1,3,5-tetraphenyl-, 1592[5]

$C_{29}H_{22}BrNO_2$ Br deriv. of mono Bz deriv., m. 208-9°, 192[2].

$C_{29}H_{22}N_2O_4$ Orcinol, bis(1-naphthalenecarbamate), 2319[5].

$C_{29}H_{22}N_4O_9$ 1,2-Pyran-2-ol, 4-(*m*-aminophenyl)-2,6-diphenyl-, monopicrate, 417[4].

$C_{29}H_{22}O_2$ 2-Furanol, 5-benzal-2,5-dihydro-2,3,4-triphenyl-, 1407[7]

$C_{29}H_{22}O_7$ Santalin, dibenzoyl-, 1405[9]

$C_{29}H_{23}NO_2$ *o*-Isoxazin-5(6)-one, 2-methyl-3,4,6,6-tetraphenyl-, 1239[9]
Mono-Bz compd., m. 160-1°, 192[2]

$C_{29}H_{24}N_4$ 2,2'-Spirobiindan-1,1'-dione, bis phenylhydrazone, isomer, 1620[2]

$C_{29}H_{24}N_4O_2$ Carbazine, 1,7-diacetamido-5,5-diphenyl-, -*HCl*, 1802[5]

$C_{29}H_{24}O$ Δ[2,4]-Pentadien-1-ol, 1,1,3,5-tetraphenyl-, 1592[4].
Phthalan, 1-benzal-2,2-dibenzyl- (?), 1804[2].

$C_{29}H_{24}O_2$ Benzopyran, ethoxytriphenyl-, 3167[5]

$C_{29}H_{25}NO$ Compd. from 2-(γ-bromopropyl)-3-hydroxy-3-phenylphthalimidine and PhMgBr, m. 194°, 1408[3].

$C_{29}H_{25}N_3$ 1,2,4-Naphthalenetriamine, *N*1-(α,α-diphenyl-*o*-tolyl)-, 1802[1]

$C_{29}H_{26}N_2O$ Benzamide, *N*-tri-*p*-tolylmethylimino-, 408[7]

$C_{29}H_{26}N_4O_2S$ Carbamide, *p*,*p'*-bis(*p*-acetamidophenyl)thio-, 752

$C_{29}H_{26}O_4$ Acetophenone, α-asaryl-α,α-diphenyl-, 2849[9].

$C_{29}H_{27}BrN_2$ 5,6-Benzocarbocyanine, 1,1'-diethyl-, bromide, 419[7].

$C_{29}H_{28}Hg_2I_4N_2$ Quinoline, complex salt with MeI and HgI_2, 3695[9].

$C_{29}H_{28}N_2O_5$ Anthroxanic acid, strychnine salt, 1801[1].

$C_{29}H_{27}N_3O_{16}$ 4'-β-Glucosidoxy-7-hydroxy-3-methoxy-5-methylflavylium picrate, 3297[5].

$C_{29}H_{28}As_2N_4O_{11}$ Carbanilide, 5,5'-bis(*p*-arsonophenylcarbamyl)-2,2'-dimethoxy-, 394[4].

$C_{29}H_{28}N_2O$ Benzoic acid, tri-*p*-tolylmethylhydrazide, 408[7].

$C_{29}H_{30}O_{13}$ Chrysophanic acid, glucoside, tetraacetate, 2679[6].

$C_{29}H_{28}O_{14}$ Emodin, glucoside, tetraacetate, 2679^{5}.

$C_{29}H_{29}AsI_4$ Tetrabenzylarsonium iodide, CHI_3 addn. compd., 2815^{9}.

$C_{29}H_{30}N_4O_7$ Brucinonic acid, phenylhydrazone, 1811^{3}.

$C_{29}H_{31}NO_9S$ Hydrastine, Me *p*-toluenesulfonate addn. compd., 1795^{6}.

$C_{29}H_{32}N_2O_6$ Quinine acetylsalicylate, 1030^{2}.

$C_{29}H_{32}N_4O_{10}$ Norcodeine, *N*-(cyclopentylmethyl)-, picrate, 3012^{7}

$C_{29}H_{32}N_6O_6$ Brucinonic acid, hydrazide, phenylhydrazone, 1811^{4}.

$C_{29}H_{33}N_3O_8$ Serine, *N*-salicylal-, cinchonidine salt, 1815^{3}.

$C_{29}H_{34}IN_3$ Compd., m. 160°, from *p*-toluquinaldine MeI and *p*,*p*-bis(dimethylamino)benzohydrol, 1627^{7}

$C_{29}H_{34}N_{10}O_{18}$ 1,3-Propanediamine, 2-(2,4-dinitrophenyl)-*N*,*N*,*N'*,*N'*-tetraethyl-, picrate, 1414^{1}.

$C_{29}H_{34}O_5S$ Thymolsulfonephthalein, di Me ether, 1615^{4}

$C_{29}H_{36}N_2O_{11}$ Acid, from β-diacetonefructose, brucine salt, 1388^{9}.
Galacturonic acid, brucine salt, 1389^{4}.

$C_{29}H_{41}N_3O_7S_2$ Imidazole, 4-(o-aminophenyl)-, di-*d*-camphor 10 sulfonate, 395^{8}.

$C_{29}H_{45}IO_5$ Compd of an acid from the prepn of digitogenic acid, m 122° and 105°, 1414^{5}.

$C_{29}H_{46}O_6$ Hyodesoxycholic acid, Me ester, diacetate, 2166^{8}

$C_{29}H_{47}IO_2$ Cholesterol, iodo-, acetate, 3299^{6}.

$C_{29}H_{48}O_2$ Sterol, acetate, 3090^{9}, 3100^{3}

$C_{29}H_{53}Br_{15}I_4N_{16}Sn$, 156^{8}

$C_{29}H_{53}Br_{15}I_3N_{16}Tl$, 156^{9}

$C_{29}H_{54}O_2$ Acid, *H salt*, m. 116 7°, 2818^{2}

$C_{30}H_{17}FeO_{12}$ + $3H_2O$ Luteolin, Fe deriv., 407^{4}

$C_{30}H_{17}FeO_{14}$ + $3H_2O$ Morin, Fe deriv., 407^{5}

$C_{30}H_{18}Cl_6O_6S_3$ Phloroglucinol, 2,4,6-tris(2,5-dichlorophenylmercapto)-, triacetate, 3289^{7}.

$C_{30}H_{18}N_2S_2$ Diindenodithiin, 10,12-bis(phenylimino)-, 3002^{4}

$C_{30}H_{19}N_3O_4$ 4,5-α,β-Naphthotriazolediol, 2-phenyl-, dibenzoate, 2859^{7}.

$C_{30}H_{20}O_4$ 9-Fluorenecarboxylic acid, 9 hydroxy-, 9-carboxy-9 fluoryl ester, 2675^{4}.

$C_{30}H_{21}KN_2O_2$ Indigotin, 7,7'-dimethyl-1,1'-diphenyl-, K deriv., 414^{6}.

$C_{30}H_{21}NO_4$ 2,7-Naphthalenediol, benzoate, diphenylcarbamate 911^{1}

$C_{30}H_{22}As_2Cl_4N_2$ Phenarsazine, 10-chloro-5,10-dihydro-, *o*-dichlorobenzene addn. compd., 1606^{8}

$C_{30}H_{22}Br_2O$ Dibromide, m 171°, from 1,3,4,6-tetraphenyl-1,6-hexanedione, 1594^{1}.

$C_{30}H_{22}Cl_2O_4Sn$ Stannane, dichlorobis(dibenzoylmethyl)-, 403^{2}.

$C_{30}H_{22}Mn_4O_{13}$ + $10H_2O$, 717^{7}.

$C_{30}H_{22}N_2O$ Benzanilide, 3'-(4,6-diphenyl-2-pyridyl)-, 417^{3}.

$C_{30}H_{22}N_2O_8$ Quinoline, 6 methoxy-2-phenyl-4-styryl-, picrate, 2681^{1}.

$C_{30}H_{22}N_8O$ Phenol, *p*-{*p*-[*p*-(*p*-phenylazophenylazo)phenylazo]phenylazo}-, 2830^{8}.

$C_{30}H_{23}As_2Cl_3N_2$ Phenarsazine, 10-chloro-5,10-dihydro-, chlorobenzene addn. compd., 1606^{9}.

$C_{30}H_{23}Cl$ Methane, chloro-1-naphthylphenyl(*p*-tolylphenyl)-, 1988^{6}.

$C_{30}H_{23}NO_4$ 1,2,6-Oxazin-5-ol, 6-methoxy-3,4,6-triphenyl-, benzoate, 1239^{8}.

$C_{30}H_{23}N_3$ Methane, (1-ethyl-2(1)-quinolylidene)di-2-quinolyl-, 2330^{1}.

$C_{30}H_{23}N_3O$ α-Naphthofuran, 1,1-dianilino-1,2-dihydro-2-phenylimino-, 593^{6}.

$C_{30}H_{23}N_3O_2$ 2-Naphthol, 1-[α-(5-phenylazosalicylal)aminobenzyl]-, 2992^{8}.

$C_{30}H_{24}$ Anthracene, 9,10-dihydro-9,9'-ethylenebis-, 2677^{6}.
9,9'-Bianthryl, 9,10-dihydro-10,10'-dimethyl-, 2677^{7}.
Methane, 1-naphthylphenyl(*p*-tolylphenyl)-, 1988^{4}.

$C_{30}H_{24}IN_3$ Methane, (1-methyl-2(1)-quinolylidene)di-2-quinolyl-, methiodide, 2330^{2}.

$C_{30}H_{24}N_2O_4$ Biacetanilide, dibenzoyl-, 3822^{4}.

$C_{30}H_{24}N_2O_8$ 1,3-Propanediol, 2-methyl-1,3-diphenyl-, bis-*p*-nitrobenzoate, 364^{4}.

$C_{30}H_{24}N_4O_2S$ 1,3,4-Thiodiazole, 2,5-bis(*N*-*p*-tolylbenzamido)-, 2162^{2}

$C_{30}H_{24}N_4O_8$ Allantoic acid, dixanthyl-, 2182^{7}.

$C_{30}H_{24}O$ Carbinol, 1-naphthylphenyl(*p*-tolylphenyl)-, 1988^{4}
Ketone, phenyl 2,4,5-triphenyl-Δ¹-cyclopentenyl, 1594^{1}

$C_{30}H_{24}OPb$ Plumbane, (*p*-phenoxyphenyl)triphenyl-, 2669^{1}

$C_{30}H_{25}As_3$ Triarsine, pentaphenyl-, 2994^{3}.

$C_{30}H_{25}NO_2$ *o*-Isoxazin-5(6)-one, 2-ethyl-3,4,6,6-tetraphenyl-, 1239^{9}
Monobenzoylmethoxy compd., m. 163-4°, 192^{2}

$C_{30}H_{26}Cl_2N_2$ Aniline, *p*,*p*'-(1,5-dichloro-9,10-anthrylene)bis[*N*,*N*-dimethyl-, 755^{9}.

$C_{30}H_{26}N_2O_2S$ Quinoline, 2-dibenzylamino-4-*p*-tolylsulfonyl-, 1626^{8}

$C_{30}H_{26}N_2O_7$ Tartranilic acid, $PhNH_2$ salt, dibenzoate, 1789^{6}.

$C_{30}H_{26}O$ Ketone, phenyl 2,3,5-triphenylcyclopentyl, 1594^{1}.

$C_{30}H_{26}O_2$ 9,9'-Bixanthyl, 9,9'-diethyl-, 2328^{6}.
Fluorene, 9-(di-*p*-phenetylmethylene)-, 365^{2}.

$C_{30}H_{27}ClO_6Zr$ Tris(α-acetylphenacyl)zirconium chloride, 403^{1}.

$C_{30}H_{28}Br_4N_2S_2$ Benzothiazole, methyl-1-toluino-, tribromide, 1951^{7}

$C_{30}H_{28}Cd_2N_2O_{12}$ + $6H_2O$, 720^{3}.

$C_{30}H_{28}Cl_2N_2$ Aniline, *p*,*p*'-(dichloro-9,10-dihydro-9,10-anthrylene)bis[*N*,*N*-dimethyl-, 754^{8}, 3166^{4}

$C_{30}H_{29}N_3O$ *p*-Toluamide, *N*-tri-*p*-tolylmethylimino-, 408^{9}

$C_{30}H_{30}N_2O_4$ 2-Propionaphthone, 1-hydroxy-, azine, diacetate, 1847^{7}

$C_{30}H_{30}O$ Benzopinacolin, *p*,*p*',*p*'',*p*'''-tetramethyl-, 408^{9}.

$C_{30}H_{30}O_4S$ Ethylene sulfide, tetra-*p*-anisyl-, 364^{9}.

$C_{30}H_{30}CoN_6O_4$, 1962^{8}.

$C_{30}H_{31}N_3O$ *p*-Toluic acid, tri-*p*-tolylmethylhydrazide, 408^{8}.

$C_{30}H_{32}O_{10}S$ Glucose, 3,5(and 5,6)-dibenzoyl-6(and 3)-*p*-toluenesulfonylmonoacetone-, $2985^{3,4}$.

$C_{30}H_{31}ClO_{15}$ 4'-Tetraacetyl-β-glucosidoxy-7-hydroxy-3-methoxyflavylium chloride, 3297^{9}.

$C_{30}H_{32}N_6O_{18}W$, 3405^{9}.

$C_{30}H_{32}O_{11}S_2$ Glucose, 6-benzoyl-3,5-di-*p*-toluenesulfonylmonoacetone-, 2985^{1}.

$C_{30}H_{34}CuO_8$ Benzoic acid, (β-acetyl-γ-hydroxy-Δ¹-butenyl)-, Et ester, Cu deriv., $2842^{3,4}$.
—, *m*-[β-(α-hydroxyethylidene)-γ-ketohexyl]-, Cu deriv., and Cu salt, 2843^{9}.

$C_{30}H_{34}N_4O_{10}$ Norcodeine, *N*-(cyclohexylmethyl)-, picrate, 3012[7].

$C_{30}H_{35}N_3O_6$ Serine, *N*-salicylal-, quinine salt, 1815[3].

$C_{30}H_{36}AlN_3O_{12}$ + H_2O Phenethylamine, aluminum oxalate, 766[6].

$C_{30}H_{36}N_4O_3$ Tripropylamine, γ,γ′,γ″-tribenzamido , 1589[6].

$C_{30}H_{36}O_7$ Chrysarobin, 411[7].

$C_{30}H_{38}N_2O_2$ 1(2) - Naphthalenone, 3,4-dihydro - 2 - (1-piperidyl)-(?), dimer, 383[5].

$C_{30}H_{39}N_3O_8$ 2,4 - Pyrroledicarboxylic acid, 5 - [bis(carboxydimethylpyrryl)methyl]-3-methyl-, tetra Et ester, 2160[4,5].

$C_{30}H_{39}N_6O_9S_3$ + $4H_2O$, 2924[5].

$C_{30}H_{40}CoN_4$ Isopyrrole, 5 ethyl-2-(5-ethyl 3-methyl - 2 - pyrrylmethylene)-3-methyl-, Co deriv , 1236[6]

$C_{30}H_{40}CuN_4$ Isopyrrole, 5-ethyl-2-(5 ethyl-3-methyl - 2 - pyrrylmethylene)-3-methyl-, Cu deriv., 1236[6].

$C_{30}H_{40}FeN_4$ Isopyrrole, ethyl 2 (ethylmethyl-2-pyrrylmethylene)methyl , Fe deriv , 1236[6], 2863[4,6]

$C_{30}H_{48}$ Lupeylene, 2671[4]

$C_{30}H_{50}$ Compd. from shark liver oil, *6 HCl*, 576[7].

Squalene, 2506[8].

$C_{30}H_{50}O$ Amyrin, 1069[9], 1399[9], 1994[7,8].

Lupeol, 1994[7].

$C_{30}H_{50}O_2$ Betulinol, 1994[5]

Sterol propionate, 3100[3].

$C_{30}H_{54}CuO_4$ Δ[3] 2 Pentadecenone, 4-hydroxy-, Cu deriv , 738[2]

$C_{30}H_{56}N_6O_{22}$ + 1 $5H_2O$, 919[3]

$C_{30}H_{54}O_9$ Caprylic acid, η formyl , Me ester, trimer, 1500[2].

$C_{30}H_{62}O$ Myricyl alcohol, 3444[4].

$C_{30}H_{52}I_4N_{20}O_8Sn$, 156[8]

$C_{31}H_{16}Cl_2O$ Perylene, 3,9 dichloro 4-[1(and 2) - naphthoyl] , 1076[9], 1077[1].

$C_{31}H_{20}O_2$ 3,3′ Spirobi[4.3 β naphthopyran], 2 phenyl , 3008[5]

$C_{31}H_{21}ClO$ Naphthyldiphenylbenzopyrylium chloride, *FeCl₃ compd* , 3167[5]

$C_{31}H_{21}ClO_5$ Naphthyldiphenylbenzopyrylium perchlorate, 3167[5].

$C_{31}H_{21}ClO_6$ 3 [(2 - Hydroxy 1 naphthyl)vinyl]-2 - phenyl - β - naphthopyrylium perchlorate, 3008[5]

$C_{31}H_{22}N_4O$ Urea, s bis(2 phenyl 4 quinolyl)-, 3010[2]

$C_{31}H_{22}O$ Benzopyran, naphthyldiphenyl , 3167[5]

$C_{31}H_{23}ClN_2$ Acridan, 2 amino 5 chloro 5,10 diphenyl , 1992[3]

$C_{31}H_{23}N_3O_2$ s Triazine, 2,4 bis(hydroxynaphthyl) 6-xylyl-, P 510[8]

$C_{31}H_{24}ClNO_5$ Propionic acid, (chlorobenzoyl)-hydroxyphenyl , methyl ester, oxime, dibenzoate, 3168[4].

$C_{31}H_{25}N$ Benzohydrylamine, *ar,ar′*-α triphenyl , 134[4].

$C_{31}H_{26}Br_2N_2$ (9 Benzyl - 9,10 - dihydro 9,10 anthrylene)bispyridinium dibromide, 3452[9]

$C_{31}H_{26}N_2O_6$ Hydrazine, α,β dibenzoyl α (β,γ-dihydroxypropyl) , dibenzoate, 2816[3]

$C_{31}H_{26}N_4O_3$ Carbazine, 1,7-diacetamido N-acetyl-5,5 diphenyl , 1802[6].

$C_{31}H_{26}N_4O_4$ 3(5) - Acridone, 1,7,9-triacetamido-5,5-diphenyl-, 1801[6].

$C_{31}H_{26}O_7$ Carbonic acid, bis[4-(o tolyl) - o-anisyl] ester, 402[1].

$C_{31}H_{26}O_7S$ 3-Benzisothioxolol, 3-(5-hydroxy-carvacryl)-, *S*-dioxide, dibenzoate, 1615[3].

$C_{31}H_{27}I_2N_3$ Methane, (1-methyl-2(1)-quinolylidene)di - 2 - quinolyl-, dimethiodide, 2330[2].

$C_{31}H_{31}FO_8$ *d*-Glucosyl fluoride, 6-triphenylmethyl-, triacetate, 1221[7].

$C_{31}H_{31}N_3O$ Benzamide, *p*-dimethylamino-*N*-tri-*p*-tolylmethylimino-, 408[8].

$C_{31}H_{31}N_3O_3$ α-Toluamidine, *N*, *N′*-di - *p*-phenetyl - *N* - phenylcarbamyl-, 1218[6].

$C_{31}H_{31}N_3O_7$ Anthroxanic acid, brucine salt, 180[1].

$C_{31}H_{32}Br_2O_7S$ Thymolsulfonephthalein, dibromo-, diacetate, 1615[3].

$C_{31}H_{32}N_2O$ Ketone, bis(*p*-dimethylaminobenzohydryl), 187[9].

$C_{31}H_{33}ClO_{13}$ 4′ - Tetraacetyl - β - glucosidoxy-7-hydroxy - 3 - methoxy - 5- methylflavylium chloride, 3297[5].

$C_{31}H_{33}N_3O$ Benzoic acid, *p*-dimethylamino-, tri-*p*-tolylmethylhydrazide, 408[8].

$C_{31}H_{34}N_2O_7S$ Benzoic acid, methylsulfinyl-, brucine salt, 3418[8].

$C_{31}H_{34}N_4O_7$ Brucinonic acid, Et ester, phenylhydrazone, 1811[4].

$C_{31}H_{34}N_6O_4$ 3 Pyrrolecarboxylic acid, 2,2′-methylenebis[5 - formyl - 4 - methyl-, di-Et ester, bisphenylhydrazone, 2159[8].

$C_{31}H_{34}O_7S$ Thymolsulfonephthalein, diacetate, 1615[3].

$C_{31}H_{36}N_2O_7S$ Brucine, Me *p* toluenesulfonate addn. compd , 1795[6].

$C_{31}H_{36}N_4O_{10}$ Norcodeine, *N*-(cycloheptylmethyl)-, picrate, 3012[7].

$C_{31}H_{38}N_2O_6S$ 10-Camphorsulfonic acid, strychnine salt, 108[2]

$C_{31}H_{46}O_4$ Diketone, m 238 40°, from hederagenin methyl ester, 3459[4].

$C_{31}H_{47}NO_4$ Monoöxime, m 156–8°, of diketone from hederagenin methyl ester, 3459[5].

$C_{31}H_{48}O_5$ Ketone, m. 208 10°, from oxidation of hederagenin methyl ester, 3459[4].

$C_{31}H_{48}O_4$ Hydroxyketone, m. 215–6°, from hederagenin methyl ester, 3459[5].

$C_{31}H_{48}O_6$ Monomethyl ester, m. 133–5°, from oxidation of hederagenin methyl ester, 3459[4]

$C_{31}H_{49}NO_5$ Oxime, m 198°, of ketone from oxidation of hederagenin methyl ester, 3459[4].

$C_{31}H_{49}NO_4$ Oxime, m 200°, of hydroxyketone from hederagenin methyl ester, 3459[5]

$C_{31}H_{49}NO_6$ Oxime, m 180°, of methyl ester from oxidation of hederagenin, 3459[4]

$C_{31}H_{50}O_2$ Amyrin, formate, 1400[2]

Reduction product, m 190-1°, of ketone from hederagenin methyl ester, 3459[4]

$C_{31}H_{50}O_4$ Reduction product, m 180 2°, of hydroxyketone from hederagenin methyl ester, 3459[5].

$C_{31}H_{52}$ Compd from shark liver oil, *6 HCl*, 576[7].

$C_{31}H_{64}O$ 16 Hentriacontanol, 2819[7]

$C_{32}H_{22}As_2N_2O_4$ Cinchophen, 6,6′-arsenobis-, 397[1]

$C_{32}H_{20}ClN_5O_2$ Flavinduline, 11 nitro-4′ phenylazo , chloride, 1084[6].

$C_{32}H_{20}N_2O_3$ Cinchophen anhydride, 2857[4].

$C_{32}H_{20}N_4O_2S_2$ Dye from diazotized thianthrenediamine and 2-naphthol, 2681[8].

$C_{32}H_{20}O_4$ Truxenediol, dibenzoate, 3002[8].

$C_{32}H_{22}O_2$ 3,3′ - Spirobi[4,3 β - naphthopyran], 2-benzyl , 3008[5].

$C_{32}H_{22}O_4$ Isoflavone, 7-hydroxy-2-styryl-cinnamate, 196[9].

$C_{32}H_{23}ClO_6$ 2-Benzyl-3-[(2-hydroxy-1-naphthyl)vinyl]-β-naphthopyrylium perchlorate, 3008[4].

$C_{32}H_{23}NO$ Ethanol, 2-imino-1,1,2-tri-1-naphthyl-, *and salts*, 47[4].

$C_{32}H_{23}N_{11}O_9$ *C*-Hydroxydiphenyltetrazolium betaine, picrate, 1223[7].

$C_{32}H_{24}MoN_2O_{12}$ Quinoline digallatomolybdate, 3405[9].

$C_{32}H_{24}N_2O_2S_2$ Benzanilide, *p'*,*p'''*-(*m*-phenylenedithio)bis-, 3163[4].

$C_{32}H_{24}N_6O_6S_2$ See *Congo red*.

$C_{32}H_{26}N_6O_2S_2$ Thioindigo, 4,4'-bis(*p*-dimethylaminophenylazo)-, 2836[8].

$C_{32}H_{26}O$ α-Dypnopinacolin (?), 2843[1].

$C_{32}H_{26}O_2$ Phthalyl alcohol, α,α,α',α'-tetraphenyl-, 3451[5]

$C_{32}H_{27}N_9$ Aniline, *N*,*N*-dimethyl-*p*-({*p*-[*p*-(*p*-phenylazophenylazo)phenylazo]phenyl-azo)-, 2836[8]

$C_{32}H_{28}N_2O_4$ Biacetotoluide, dibenzoyl-, 3822[4].

Succinonitrile, tetra-*p*-anisyl-, 1402[4].

$C_{32}H_{28}N_2O_8$ 4,4-Bidinicotinic acid, 4,4'-diethyl-1,4,1',4'-tetrahydro-1,2,6,-1',2',6'-hexamethyl-, tetra-Et ester, 3296[4].

$C_{32}H_{28}N_8O_2$ Indigotin, 6,6'-bis(*p*-dimethylaminophenylazo)-, 2836[8].

$C_{32}H_{30}$ 9,9'-Bianthryl, 9,10,9',10'-tetrahydro-10,10,10',10'-tetramethyl-, 2677[7].

$C_{32}H_{30}N_2O_2$ β-Truxinanilide, *N*,*N'*-dimethyl-, 2664[8]

$C_{32}H_{30}O_4$ Peroxide, bis(9-isopropyl 9 xanthyl), 2328[8].

$C_{32}H_{34}N_4O_8$ 3,4-Pyrazoledicarboxylic acid, 1,1'-*p*-biphenylenebis[5-methyl-, tetra-Et ester, 599[1].

$C_{32}H_{34}O_9$ Glucoside, α-methyltriphenylmethyl triacetyl-, 1221[6].

$C_{32}H_{36}CrN_6O_4S_2$ + $6H_2O$ Dimethylene blue chromate, 1240[1].

$C_{32}H_{36}N_6O_4$ 3-Pyrrolecarboxylic acid, 2,2'-ethylenebis[5-formyl-4-methyl-, di-Et ester, bisphenylhydrazone, 2159[6].

$C_{32}H_{40}N_2O_4S_2$ Camphoranilic acid, *o*,*o'*-dithiobis-, 600[7].

$C_{32}H_{42}O_4$ Dehydrohyodesoxycholic acid, anisal-, Me ester, 2166[4].

$C_{32}H_{49}NO_9$ See *Veratrine*.

$C_{32}H_{50}O_6$ Dimethyl ester, m 161–3°, from oxidation of hederagenin methyl ester, 3459[8].

$C_{32}H_{52}O_3$ Betulinol, monoacetate, 1994[9].

$C_{32}H_{52}O_4$ Hederagenin, methyl ester, 3459[3].

$C_{32}H_{58}CuO_4$ Δ^3-2-Hexadecenone, 4-hydroxy-, Cu deriv., 738[9]

$C_{32}H_{62}O_3$ Palmitic anhydride, 2818[7].

$C_{32}H_{64}O_2$ Laccerolic acid, 2390[7].

Palmitic acid, cetyl ester, 2818[7].

$C_{32}H_{66}O$ Cetyl ether, 361[8].

Laccerol, 2390[7].

$C_{33}H_{30}O_9$ Rottlerin, 182[4]

$C_{33}H_{21}N_3O_3$ *s*-Triazine, (hydroxynaphthyl)-4,6-bis(hydroxynaphthyl)-, P 510[8].

$C_{33}H_{23}ClN_2O$ 9,10-Dihydro-9-keto-7,8,10-triphenylcyclopentabenzoquinoxalinium chloride, 207[8].

$C_{33}H_{23}N_3O_4$ 9,10-Dihydro-9-keto-7,8,10-triphenylcyclopentabenzoquinoxalinium nitrate, 207[8].

$C_{33}H_{24}O$ Benzopyran, tetraphenyl-, 3167[8].

$C_{33}H_{24}O_2$ Compd., m. 278°, from 1,1'-benzenyl-bis-2(1)-naphthalenone and PhMgBr, 1803[6].

$C_{33}H_{25}BrO_2$ 3,5-Xylaldehyde, α-bromo-4-hydroxy-α,α,α',α'-tetraphenyl-, 906[8].

$C_{33}H_{26}N_4O_{11}$ 4-(*p*-Acetamidophenyl)-2,6-di-*p*-anisylpyrylium picrate, 758[8].

$C_{33}H_{26}O_2$ 3,5-Xylaldehyde, 4-hydroxy-α,α,α',α'-tetraphenyl-, 906[9].

$C_{33}H_{30}N_4O_6$ Phthalimide, γ,γ',γ''-nitrilotris[*N*-propyl-, *and* -*HBr*, 1589[8].

$C_{33}H_{31}NO_6$ Boldine, dibenzoyl deriv., 1406[8].

$C_{33}H_{35}Hg_2I_5N_2$ Quinoline, complex salt with PrI and HgI_2, 3695[9].

$C_{33}H_{35}N_5O_5$ See *Ergotamine*.

$C_{33}H_{36}N_{16}O_{28}$ Tripropylamine, γ,γ',γ''-triamino-, tetrapicrate, 1589[8]

$C_{33}H_{37}NO_6S$ Thymolsulfonephthalein, $PhNH_2$ salt, 1615[4]

$C_{33}H_{37}N_3O_8$ Serine, *N*-salicylal-, brucine salt, 1815[3]

$C_{33}H_{38}N_4O_2$ Δ^1-Cyclohexenecarboxylic acid, 6-(*p*-dimethylaminophenyl)-4-(*p*-dimethylaminostyryl)-2-keto-, Et ester, phenylhydrazone, 173[1]

$C_{33}H_{39}AsN_2O_6S$ Benzoic acid, *p*-(ethylmethylarsyl)-, As-sulfide, brucine salt, 363[8].

$C_{33}H_{40}N_7O_{12}P$ Guanylic acid, brucine salt, 768[1]

$C_{33}H_{42}N_2O_8S$ 10-Camphorsulfonic acid, brucine salt, 408[2].

$C_{33}H_{54}O_6$ Sterol glucoside, 3100[1]

$C_{33}H_{61}N_4O_4$ Spathulatine, 1863[7]

$C_{34}H_{14}Cl_4O$ Fluoran, 12,13,14,15-tetrachloro-3,4-dihydroxy-, dibenzoate, 3001[7].

$C_{34}H_{16}O_2$ Isoviolanthrone, 1076[4]

$C_{34}H_{18}Br_2O_4$ 3,9-Perylenediol, bis-*p*-bromobenzoate, 1077[4].

$C_{34}H_{18}Cl_4O_6$ Isophenolphthalein, tetrachloro-, dibenzoate, 596[8]

$C_{34}H_{18}O_{10}$ Difluorescein, 2836[9]

3-Isoxanthone, 9,9'-(2,5-dicarboxy-*p*-phenylene)bis[6-hydroxy-, 2836[9].

$C_{34}H_{20}O_4$ 3,9-Perylenediol, dibenzoate, 1077[3]

$C_{34}H_{20}O_5$ $\Delta^{2,2'}$-Biindan-1,3,1'-trione, 2'-α-1,3-diketo-2-indanylbenzyl-, 911[7].

$C_{34}H_{23}ClN_6O_2$ 10-Nitro-2-phenyl-13-(*p*-phenylazophenyl)-2-benzotriazolophenaz-13-onium chloride, 2860[1].

$C_{34}H_{23}N_7O_5$ 10-Nitro-2-phenyl-13-(*p*-phenylazophenyl)-2-benzotriazolophenaz-13-onium nitrate, 2860[9].

$C_{34}H_{24}N_6O_3$ 10-Nitro-2-phenyl-13-(*p*-phenylazophenyl)-2-benzotriazolophenaz-13-onium hydroxide, 2860[9].

$C_{34}H_{22}O_8$ 1,2,3,4-Benzenetetrol (?), tetrabenzoate, 3695[9].

$C_{34}H_{22}O_{10}S$ Benzenesulfonic acid, *o*-(2,3,4-trihydroxybenzoyl)-, tribenzoate, 2401[7].

$C_{34}H_{23}N_3O_3$ *S*-Triazine, 2,4-bis(4-hydroxynaphthyl)-6-(2-methoxynaphthyl)-, P 510[8]

$C_{34}H_{24}S_2$ $\Delta^{4,4'}$-Bi-1,4-thiopyran, 2,6,2',6'-tetraphenyl-, 200[8].

$C_{34}H_{26}I_2N_2O_3$ Cinchophen anhydride, dimethiodide, 2857[4].

$C_{34}H_{26}O_{11}$ Xylindein, 406[4].

$C_{34}H_{27}FO_9$ *d*-Glucosyl fluoride, tetrabenzoate, 1221[7].

$C_{34}H_{26}N_6O_6S_2$ See *Benzopurpurin*.

$C_{34}H_{28}O_2$ Cyclobutane, 1,3-dicinnamoyl-2,4-diphenyl-, 180[8].

$C_{34}H_{28}O_8$ Acrylic acid, β-*p*-phenoxybenzoyl-, Me ester, dimer, 593[4].

$C_{34}H_{30}Cl_6O_4Pt$ 7-Methoxy-2-methyl-4-

phenylbenzopyryiium chloroplatinate, 2490[1].
$C_{34}H_{30}N_2O_8Th$, 717[7].
$C_{34}H_{32}FeN_4O_5$ See *Hemin*, *hydroxy-*.
$C_{34}H_{34}O_2$ 9,9'-Bixanthyl, 9,9'-diisobutyl-, 2328[7].
$C_{34}H_{34}O_4$ Peroxide, bis(9-*sec*-butyl-9-xanthyl), 2328[7].
—, bis(9-isobutyl-9-xanthyl), 2328[8].
$C_{34}H_{34}O_6$ Addn. compd., m. 122°, of 5,6,7,8-tetrahydro-2-naphthol and di-Ph oxalate, 47[2].
$C_{34}H_{36}AsN_2O_4$ + $3H_2O$ arsinic acid, benzyl phenyl-, strychnine salt, 2839[7].
$C_{34}H_{37}IN_2O_4$ 6-Benzyloxy - 7 - (6-benzyloxy-3,4-dihydro - 7 - hydroxy - 2 - methyliso-quinoliniumoxy) - 3,4 - dihydro - 2 - methylisoquinolinium iodide, 3011[2].
$C_{34}H_{36}Cl_2N_4O_2$ 9,9'-Bi[3 - isoxanthene]-6,6'-diamine, *N*, *N*, *N'*, *N'* - tetramethyl-3,3'-bis(methylimino) , 3,3' - bis(metho-chloride, 2836[9].
Dipyronine G, 2836[9].
$C_{34}H_{39}NO_3$ β-Truxinanilic acid, menthyl ester, 2664[6].
$C_{34}H_{42}CuO_6$ Benzoic acid, *m*-[β-(α-hydroxy-ethylidene) - γ - ketohexyl]-, Et ester, Cu deriv., 2843[4]
$C_{34}H_{40}N_4$ Aniline, *p*, *p'*, *p''*, *p'''* - acetylene-tetrakis[*N*,*N* dimethyl , 2836[3].
$C_{34}H_{44}N_4O_6$ Compd. from 2,2'-methylenebis-[4 - methyl - 3 - pyrrolecarboxylic acid] and dimethylaminobenzaldehyde, 2159[8].
$C_{34}H_{44}O_{21}$ Diosmin, 391[7], 799[6].
$C_{34}H_{48}N_2$ 1,1'-Bi[3 - *p* - menthylamine], *N*, *N'*-dibenzal-, 1614[7].
$C_{34}H_{48}N_2O_2$ 1,1'-Bi[3 - *p* - menthylamine], *N*, *N'*-dibenzoyl , 1614[7].
—, *N*, *N'* disalicylal-, 1614[7].
$C_{34}H_{48}N_2O_4$ 1,1' Bimenthol, dicarbanilate, 1614[8].
$C_{34}H_{50}O_2$ Sterol, benzoate, 3100[2,3].
$C_{34}H_{54}Mo_4N_8O_{31}$ + $8H_2O$ Ethylenediamine mono-gallatomolybdate, 3406[1].
$C_{34}H_{52}O_3S$ Cholesterol, *p*-toluenesulfonate, 2816[3].
$C_{34}H_{53}BrO_4$ Betulinol, bromo-, diacetate, 1995[3].
$C_{34}H_{54}O_4$ Betulinol, diacetate, 1994[8].
$C_{34}H_{62}CuO_4$ Δ^3 2-Heptadecenone, 4-hydroxy-, Cu deriv , 738[9].
$C_{34}H_{66}O_4$ 1,32 - Dotriacontanedicarboxylic acid, 47[7].
$C_{35}H_{22}Br_4O_7S$ *m* - Cresolsulfonephthalein, tetra-bromo , dibenzoate, 3001[4].
$C_{35}H_{23}ClO$ Dinaphthylphenylbenzopyrylium chloride, *FeCl₃ compd.*, 3167[7].
$C_{35}H_{23}ClO_5$ Dinaphthylphenylbenzopyrylium perchlorate, 3167[7].
$C_{35}H_{23}N_7O_{15}$ 4-(*m* - Aminophenyl)-2,6-diphenyl-pyrylium picrate, picrate, 417[4], 758[1].
$C_{35}H_{24}IN_3$ Dye, m. above 300°, from 2,2',2''-methenyltrisquinoline, $PhCHCl_2$ and KI, 2330[3].
$C_{35}H_{24}N_8O_{14}$ Pyridine, 2(and 4)-(*m*-amino-phenyl) - 4,6(and 2,6)-diphenyl-, di-picrate, 417[3,4].
$C_{35}H_{24}O$ Benzopyran, dinaphthylphenyl-, 3167[7].
$C_{35}H_{25}$ $\Delta^{1,4}$ - Cyclopentadienyl, pentaphenyl , 384[1].
$C_{35}H_{25}Br$ Cyclopentadiene, 5-bromopenta-phenyl-, 383[9].
$C_{35}H_{25}Cl$ Cyclopentadiene, 5-chloropenta-phenyl-, 383[9].
$C_{35}H_{25}NO_3$ 1,2,6-Oxazin-5-ol, 3,4,6,6-tetra-phenyl-, benzoate, 1239[9].
$C_{35}H_{25}N_3$ Methane, benzyltri-2-quinolyl-, *and salts*, 2330[1].
$C_{35}H_{26}$ Cyclopentadiene, 1,2,3,4,5-penta-phenyl-, 384[1].
$C_{35}H_{26}Cl_2N_3$ Compd., m. 245°, from 2,2',2''-methenyltrisquinoline and $PhCHCl_2$, 2330[2].
$C_{35}H_{26}O$ $\Delta^{2,4}$-Cyclopentadienol, pentaphenyl-, 383[9].
$C_{35}H_{26}O_7S$ *m* - Cresolsulfonephthalein, dibenzo-ate, 3001[3].
$C_{35}H_{27}Cl_2N_3$ Compd. from 2,2',2''-methenyl-trisquinoline and benzyl chloride, 2329[8].
$C_{35}H_{30}N_4O$ Urea, α,β - bis[β-(2-phenyl-4-quinolyl)ethyl]-, 1413[6].
$C_{35}H_{30}O_2$ 1,2 - Cyclopentanediol, 1,2,3,4,5-pentaphenyl-, 384[1].
$C_{35}H_{33}N_3O_8$ Succinic acid, α,β-dibenzamido-, morphine deriv., 48[6].
$C_{35}H_{34}N_{10}O_{10}$ Ethylenediamine, *N*-benzyl-*N'*-phenyl-, dipicrolonate, 1624[1].
$C_{35}H_{36}N_2O_6$ Truxillamidic acid, morphine salt, 1392[6].
$C_{35}H_{39}Hg_2I_8N_3$ Quinoline, complex salt with BuI and HgI_2, 3695[9].
$C_{35}H_{39}N_5O_5$ See *Ergotinine*.
$C_{35}H_{41}NO_3$ β-Truxinanilic acid, *N*-methyl-, menthyl ester, 2664[7], 2665[1].
$C_{35}H_{41}N_5O_6$ See *Ergotoxine*.
$C_{35}H_{42}N_2O_5$ Cyclohexanecarbinol, α-methyl-, acid phthalate, cinchonine salt, 3287[1].
$C_{35}H_{72}$ Pentatriacontane, 2819[3].
$C_{35}H_{72}O$ 18-Pentatriacontanol, 2819[2].
$C_{36}H_{14}Cl_4$ Decacyclene, tetrachloro-, 2851[5].
$C_{36}H_{15}Cl_3$ Decacyclene, trichloro-, 2851[5].
$C_{36}H_{16}O_6$ Violanthrone - *bz* - 2,2 - dicarboxylic acid, 3293[4].
$C_{36}H_{18}O$ Decacyclenol, 2851[6]
$C_{36}H_{18}O_2$ Decacyclenediol, 2851[6].
$C_{36}H_{18}O_3$ Decacyclenetriol, 2851[6].
$C_{36}H_{18}O_5S$ Decacyclenesulfonic acid, dihy-droxy-, 2851[5].
$C_{36}H_{18}O_7S_2$ Decacyclenedisulfonic acid, hy-droxy-, 2851[5].
$C_{36}H_{18}O_9S_3$ Decacyclenetrisulfonic acid, *and tri-Na salt*, 2851[4].
$C_{36}H_{19}ClO_4$ Isoviolanthrone, chlorodimethoxy-, 1076[9].
$C_{36}H_{20}O_2$ Isoviolanthrone, dimethyl , 1076[8,9].
$C_{36}H_{22}Cl_2O_2$ Perylene, 3,9-dichloro-4,10-di-toluyl-, 1076[7].
$C_{36}H_{22}Cl_2N_4$ Di - 2 - indenylamine, 3,3'-di chloro - *N* - phenyl-1,1'-bis(phenyl-imino)-, 3002[3].
$C_{36}H_{23}N_3S$ Diindenothiazine, 11,12-dihydro-11-phenyl - 10,12 - bis(phenylimino)-, 3002[4]
$C_{36}H_{24}N_8O_4$ 10-Nitro - 2 - phenyl-13-(*p* phenyl-azophenyl) - 2 - benzotriazolophenaz-13-onium acetate, 2860[1].
$C_{36}H_{24}O_4$ Perylene, 3,9-dianisoyl-, 1076[6].
$C_{36}H_{25}Mn_2Na_7O_{33}$ + $12H_2O$, 717[6].
$C_{36}H_{26}$ Fulvene, 1,2,3,4,6 - pentaphenyl-, 1407[8].
$C_{36}H_{26}N_2O_4$ 2,7-Naphthalenediol, bis(diphenyl-carbamate), 911[1].
$C_{36}H_{27}NO_3$ Di-Bz compd., m. 191–3°, 192[1].
$C_{36}H_{27}N_3O_5$ Semicarbazide, 1,1,2,4-tetra-benzoyl-4-*p*-tolyl-, 2161[9]
$C_{36}H_{28}N_3O_8Sn$ + $2H_2O$ Quinoline tripyrocate-cholatostannate, 3404[9].
$C_{36}H_{28}N_6$ Phenazine, 8-amino-2,7-dianilino-

3,5-dihydro - 5 - phenyl-3-phenylimino-, - *HCl*, 602[7].

$C_{36}H_{28}O$ $\Delta^{2,4}$ - Cyclopentadienol, 1-benzyl-2,3,4,5-tetraphenyl-, 1407[8].

$C_{36}H_{29}N_3O_6$ Glycerol, tri-1-naphthalenecarbamate, 1232[9].

$C_{36}H_{30}As_4$ Tetrarsine, hexaphenyl-, 2994[4].

$C_{36}H_{30}N_2O_{10}W$, 3405[9].

$C_{36}H_{30}O_{11}$ Xylindein, di-Me ether, 406[5].

$C_{36}H_{31}CuN_2O_6$ Ketone, 2-furyl-α-hydroxybenzyl, oxime, Cu deriv., 1055[8].

$C_{36}H_{32}N_2O_8$ Pyrazine, 2,5-bis(3,4-dimethoxyphenyl)-3,6-dipiperonyl-, 1083[9].

$C_{36}H_{33}N_3O_{20}$ 4′ - Tetraacetyl-β-glucosidoxy-7-hydroxy - 3 - methoxyflavylium picrate, 3297[3].

$C_{36}H_{34}Cl_6O_6Pt$ 5,7(6,7 and 7,8)-Dimethoxy 2-methyl - 4 - phenylbenzopyrylium chloroplatinate, 2499[1].

$C_{36}H_{38}O_2$ 9,9′-Bixanthyl, 9,9′ diisoamyl-, 392[6].

$C_{36}H_{39}N_5O_7$ Histidine, N-salicylal, brucine salt, 1815[3].

$C_{36}H_{42}N_4O_{13}$ Succinic acid, α,α′-p-biphenylenedisazobis[α,β - diacetyl-, tetra-Et ester, 599[2].

$C_{36}H_{46}Cl_3Fe_4N_6O_{16}$, 1180[6].

$C_{36}H_{54}O_3$ Benzene, s-tricampholyl-, 1399[8].

$C_{36}H_{56}I_6N_2O_8$ Dinicotinic acid, 4 isobutyl 2,6-dimethyl-, di-Et ester, methiodide, periodide, 3296[2].

$C_{36}H_{56}N_2O_8$ 4,4′ - Bidinicotinic acid, 1,4,1′,4′-tetrahydro - 4,4′ - diisobutyl 1,2,6,1′,-2′,6′-hexamethyl-, tetra-Et ester, 3296[4].

$C_{36}H_{56}N_{10}O_{32}Pt_2$ + $12H_2O$, 2961[3].

$C_{36}H_{60}O_{12}$ Inositol, hexaisovalerate, 2831[5].

$C_{36}H_{60}O_{30}$ Hexahexosan, 1598[1].

$C_{36}H_{64}O_{20}$ Tetra(trimethylglucosan), 743[4]

$C_{36}H_{66}AlN_3O_{12}$ + H_2O, 1-Menthylamine, aluminum oxalate, 766[8].

$C_{36}H_{66}CuO_4$ Δ^3 2 Octadecenone, 4 hydroxy, Cu deriv., 738[9].

$C_{36}H_{70}O_3$ Stearic anhydride, 2818[7]

$C_{36}H_{96}Co_2I_6N_{20}O_{18}$ + $3H_2O$, 1962[1]

$C_{37}H_{20}O_6$ $\Delta^{2,3'}$-Biindan - 1,3,1′-trione, 2′,2‴ methylenebis-, 911[6].

$C_{37}H_{23}N_3O_2$ s-Triazine, 6 anthryl 2,4 bis(4 hydroxynaphthyl)-, P 510[8]

$C_{37}H_{28}N_6O_3S$ Carbanilide, p,p′-bis[p-(p-hydroxyphenylazo)phenyl]thio, 1394[1].

$C_{37}H_{30}N_2$ Cyclopentadiene, 5 (p-dimethyl aminophenylimino) - 1,2,3,4 - tetraphenyl-, 383[8].

$C_{37}H_{35}N_3O_{20}$ 4′ - Tetraacetyl-β-glucosidoxy 7-hydroxy - 3 - methoxy - 5 - methylflavylium picrate, 3297[5].

$C_{37}H_{39}N_3O_9$ See *Xantholine*.

$C_{37}H_{40}Hg_2I_4N_4$ Quinoline, complex salt with $C_5H_{11}I$ and HgI_2, 3695[9]

$C_{37}H_{47}I_{11}N_2$ Benzyldiethylphenylammonium iodide, CHI_3 addn. compd, 2815[8]

$C_{37}H_{51}NO_{10}$ Taxine, 767[2].

$C_{37}H_{53}NO_4$ Amyrin, m nitrobenzoate, 1400[1].

$C_{38}H_{18}O_{12}S_2$ Spiro[1,3 - benzodioxan 2,1′ phthalan] - 4,2′ dione, 6,6″-phthalidenedithiobis, 182[9]

$C_{38}H_{22}O_2S$ Diacenaphthothiophenene, 3,11-dibenzoyl, 1076[2].

$C_{38}H_{26}N_4O_8$ Ethanol, 2 imino-1,1,2-tri-1-naphthyl-, picrate, 47[4].

$C_{38}H_{26}N_8O_{14}$ 9,10 - Anthrylenedimethylenebispyridinium picrate, 3004[1].

$C_{38}H_{26}O_8S$ Iso-2,4-hydroxynaphthoic acid sulfide, di-Me ester, dibenzoate, 1234[1].

1-Naphthoic acid, 4,4′-thiobis[3 hydroxy-, di-Me ester, dibenzoate, 1233[9].

$C_{38}H_{27}N_7O_3$ Acetonitrile, tris[p-(p-hydroxyphenylazo)phenyl]- (?), 585[9].

$C_{38}H_{30}$ o,o′ - Bitolyl, α,α,α′,α′-tetraphenyl-, 2675[4].

$C_{38}H_{30}N_2OSb_2Se_2$ Stibine, triphenyl-, selenocyanate oxide (?), 3288[4].

$C_{38}H_{30}O_2$ o,o′-Bi[benzyl alcohol], α,α,α′,α′-tetraphenyl-, 2675[2].

$C_{38}H_{33}N_{11}O_{10}$ Isoquinoline, 2-[o-(β-aminoethyl)benzyl] - 1,2,3,4 - tetrahydro-, dipicrolonate, 418[2].

$C_{38}H_{38}O_2$ 9,9′ - Bixanthyl, 9,9′dicyclohexyl-, 392[7].

$C_{38}H_{38}O_4$ Peroxide, bis(9 cyclohexyl 9 xanthyl)-, 392[8].

$C_{38}H_{42}O_2$ 9,9′ Bixanthyl, 9,9′ dihexyl, 392[7].

$C_{38}H_{44}O_7$ Gitoxigenin, di Bz deriv, 209[1].

$C_{38}H_{46}N_4O_4$ Bis(tetramethyldiaminodiphenyl carbinyl acetate), leuco base, 2836[9]

$C_{38}H_{48}FeN_4O_8$ 4 - Isopyrrolecarboxylic acid, 2-(4 carboxy 3,5-dimethyl-2 pyrryl methylene)-3,5 dimethyl, di Et ester, Fe salt, 2863[4]

$C_{38}H_{50}N_8O_{14}$ Dipicrate, m 258 9°, of base from conessine dimethosulfate, 3458[6]

$C_{38}H_{53}NO_2$ Cholesterol, 1 naphthalenecarbamate, 1232[9]

$C_{38}H_{62}$ Bibenzyl, α,α,α′,α′ tetracyclohexyl, 190[2]

$C_{38}H_{56}O_3$ Amyrin, anisate, 1399[9], 1400[1].

$C_{38}H_{66}O_{17}$ Picrocrocin, 797[5,8]

$C_{38}H_{70}CuO_4$ Δ^3 2 Nonadecenone, 4 hydroxy, Cu deriv, 739[1]

$C_{38}H_{74}O_4$ 1,32 Dotriacontanedicarboxylic acid, di Et ester, 17[4]

$C_{39}H_{30}O_2$ Acetic acid, triphenyl, triphenyl methyl ester, 109[7]

$C_{39}H_{32}N_2O$ Carbanilide, o,o′ and p,p′) di benzohydryl, 591[6,7]

$C_{39}H_{40}N_2O_3S$ Thymolsulfonephthalein, dianilino deriv, 1615[5]

$C_{39}H_{42}O_9$ Rottlerin, hexa Me ether, 182[6]

$C_{39}H_{46}N_2O_6$ Carvomenthol, acid phthalate, strychnine salt, 1397[4]

$C_{39}H_{48}N_2O_8$ Cyclohexanecarbinol, α methyl, acid phthalate, brucine salt, 3287[1]

$C_{39}H_{48}O_{14}$ Primary lignin, decomps 90°, 1598[4]

$C_{39}H_{74}O_6$ Palmitin, α,γ-di, β butyryl, 2818[7]

$C_{39}H_{77}O_8P$ Glycerophosphoric acid, distearate, 3011[2].

$C_{40}H_{20}O_4$ + H_2O 3,9-Perylenequinone, dimer, 1077[2].

$C_{40}H_{26}O_4$ Peroxide, bis(10 phenoxy 9-phenanthryl), 412[2].

$C_{40}H_{24}O_6$ 1,3 - Indandione, 2,2′ [2 (1,3-diketo 2 - indanylmethyl) - 3 - keto 2 indanylidenemethylene]bis, AcOH addn. compd, 911[8].

$C_{40}H_{28}Cl_2O_2$ 9,9′ - Bixanthyl, 9,9′ bis(p chlorobenzyl)-, 392[8]

$C_{40}H_{33}NO_6$ 2,6 - Phenanthrenediol, 3,5 dimethoxy 8 - [β - (N - methylbenzamido) ethyl], dibenzoate, 1406[1].

$C_{40}H_{34}O_{13}$ Xylindein, diacetyl, di-Me ether, 406[6].

$C_{40}H_{38}O_{13}$ Leucoxylindein, diacetyl-, di-Me ether, 406[6].

$C_{40}H_{50}O_{14}$ Compd., decomps. 110°, from primary lignin, 1598[9]

$C_{40}H_{60}O_{14}$ Digitalin, 2724[8].

$C_{40}H_{74}CuO_4$ Δ^3 - 2 - Eicosenone, 4-hydroxy-, Cu deriv., 739[1].

$C_{41}H_{34}O_8$ 1,1,2 - Ethanetriol, 1,2-bis(2,4-dihydroxyphenyl) - 2 - phenyl-, anhydride tribenzoate, 2324[2].
$C_{41}H_{36}N_2O$ Urea, s-bis(β-triphenylethyl), 134[6].
$C_{41}H_{38}O_7S$ Thymolsulfonephthalein, dibenzoate, 1615[4].
$C_{41}H_{41}FO_{17}$ Glucosyl fluoride, 6 (tetraacetyl-β-glucosido)-2,3,5-tribenzoyl-, 1221[8].
$C_{41}H_{44}Br_2O_{10}$ Rottlerin, hexa-Me ether, monoacetate, dibromide, 182[5].
$C_{41}H_{44}O_{10}$ Rottlerin, hexa-Me ether, monoacetate, 182[5].
$C_{41}H_{64}O_{10}$ Sterol glucoside acetate, 3100[1].
$C_{41}H_{84}NO_9P$ Glycerophosphoric acid, distearate, colamine salt, 3014[6].
$C_{42}H_{24}O_6$ Decacyclenetriol, triacetate, 2851[6].
$C_{42}H_{28}$ Rubrene, 3004[1]
$C_{42}H_{28}Br_6N_4S_2$ β Naphthothiazole, 2 (1-naphthylamino), tribromide, 195[4].
$C_{42}H_{30}K_2O_{12}$ Quinizarin, di-K deriv., salicylaldehyde addn compd, 741[5].
$C_{42}H_{30}Na_2O_{12}$ Quinizarin, di Na deriv., salicylaldehyde addn compd, 741[5].
$C_{42}H_{30}O_2$ 9,9′ - Bianthryl, 10,10′-dibenzoyl-9,9′,10,10′-tetrahydro, 3292[9].
$C_{42}H_{33}ClN_6$ Induline 6B, 602[6].
$C_{42}H_{34}Br_2$ Truxilldiol, tetraphenyl-, dibromide, 1391[8].
$C_{42}H_{34}Cl_2$ Truxilldiol, tetraphenyl, dichloride, 1391[8]
$C_{42}H_{34}N_2O_{10}S$ d Glucose, benzoylthioureide, tetrabenzoate, 1596[3].
$C_{42}H_{34}O$ Truxilldiol, tetraphenyl-, oxide, 1391[7].
$C_{42}H_{34}O_2$ 9,9′ - Bixanthyl, 9,9′-diphenethyl-, 2328[5].
$C_{42}H_{34}O_{18}$ Xylindein, tetraacetyl-, 406[5].
$C_{42}H_{36}O_2$ Truxilldiol, tetraphenyl, 1391[6,7].
$C_{42}H_{44}CuN_2O_{13}$ 5,5 - Isoxazolidinedicarboxylic acid, 2 hydroxy - 3,4 - diphenyl-, di-Et ester, Cu deriv., 2327[4].
$C_{42}H_{44}O_{20}$ Acaciin, heptaacetate, 2162[4]
$C_{42}H_{52}N_4O_7S$ Butyric acid, β sulfo, cinchonine salt, 2482[5]
$C_{42}H_{54}CdN_4O_4$ Isopyrrole, 5 ethyl 2 (5-ethyl 3 methyl 4 - propionyl 2 pyrrylmethylene) - 3 - methyl - 4 - propionyl, Cd deriv., 1236[4]
$C_{42}H_{54}CoN_4O_4$ Isopyrrole, 5 ethyl 2 (5-ethyl-3 methyl - 4 - propionyl 2 pyrrylmethylene) - 3 - methyl 4 propionyl, Co deriv., 1236[4].
$C_{42}H_{54}CuN_4O_4$ Isopyrrole, 5 ethyl 2-(5 ethyl 3 methyl - 4 - propionyl - 2 - pyrrylmethylene) 3 methyl - 4 - propionyl, Cu deriv., 1236[4].
$C_{42}H_{54}FeN_4O_4$ Isopyrrole, 5 ethyl 2 (5 ethyl-3-methyl - 4 - propionyl 2 pyrrylmethylene) - 3 - methyl 4 propionyl, Fe salt, 2863[4].
$C_{42}H_{54}N_4O_4Zn$ Isopyrrole, 5-ethyl-2 (5-ethyl 3 methyl 4 - propionyl 2 pyrrylmethylene) - 3 - methyl 4 propionyl, Zn deriv., 1236[4].
$C_{42}H_{58}N_4O_4$ Pyrrole, 2,2′,2″,2‴-acetylenetetrakis[5 - ethyl 3 - methyl-4-propionyl, 1236[4].
$C_{42}H_{66}N_{18}Ni_2O_{28}$ + $3H_2O$ Tristriaminotriethylaminebisnickelous tetrapicrate, 1589[1].
$C_{42}H_{72}O_{36}$ Heptaglucosan, 743[1].
$C_{42}H_{78}CuO_4$ Δ^3 - 2 - Heneicosenone, 4-hydroxy, Cu deriv., 739[1].
$C_{42}H_{82}O_4$ Compd., m. 70.5 1.3°, from α iodohydrin and K stearate, 2658[8].
$C_{42}H_{32}N_8O_{14}$ Methane, (1-methyl-2(1)-quinolylidene)di - 2 - quinolyl-, dimethopicrate, 2330[2].
$C_{43}H_{35}As_2N_5O_{13}$ Carbanilide, m,m′-bis[5-[(5-arsono - 2 - hydroxyphenyl)carbamyl]-o-tolylcarbamyl]-, P 970[6].
$C_{43}H_{67}N_4O_{10}P$ Glycerophosphoric acid, quinine salt, 1219[4].
$C_{43}H_{80}NO_9P$ Lecithin, 1649[3].
$C_{43}H_{88}NO_{10}P$, 1831[6].
$C_{44}H_{30}O_2$ Compd. from 3-benzal-2-phenyl-1-indanone, m. 263–5°, 1804[4].
$C_{44}H_{34}Cl_6O_4Pt$ 7 - Methoxy - 2,4 - diphenylbenzopyrylium chloroplatinate, 2499[2].
$C_{44}H_{38}O_2$ 9,9′ - Bixanthyl, 9,9′-bis(γ-phenylpropyl)-, 2328[8].
$C_{44}H_{56}N_4O_9S$ + $6H_2O$ Butyric acid, β-sulfo-, quinine salt, 2482[5].
$C_{44}H_{57}N_4O_{11}P$ Glucosephosphoric acid, cinchonidine salt, 1979[9].
$C_{44}H_{60}N_2O_4$ Betulinol, dicarbanilate, 1995[1].
$C_{44}H_{78}O_2$ Sterol ester, of acid from rubber resin, 3099[9].
$C_{44}H_{82}CuO_4$ Δ^3 - 2 - Docosenone, 4-hydroxy-, Cu deriv., 739[1].
$C_{44}H_{90}NO_9P$ Glycerophosphoric acid, distearate, choline salt, *and chloroplatinate*, 3014[4], 3015[1,3].
$C_{44}H_{32}N_6O_2S$ Carbanilide, p,p′-bis[p - (2-hydroxy - 1 - naphthylazo)phenyl]thio-, 1394[1].
$C_{44}H_{35}N_{13}O_{20}$ Toluene, 2,4,6-trinitro-, addn. compd. with azoxybenzene, 1062[5]
$C_{44}H_{36}O_3$ Decacyclene, tripropoxy, 2851[6]
$C_{45}H_{86}O_6$ Myristin, 3280[7], 3283[1].
$C_{46}H_{34}O_4$ 9,9′ - Bianthryl, 10,10′-dibenzoyl-9,9′,10,10′ tetrahydro, diacetate, 3292[9].
$C_{46}H_{37}FO_8$ d-Glucosyl fluoride, 6-triphenylmethyl-, tribenzoate, 1221[7].
$C_{46}H_{38}Cl_6O_6Pt$ 5,7(and 7,8)-Dimethoxy-2,4-diphenylbenzopyrylium chloroplatinate, 2499[2].
$C_{46}H_{35}O_2$ Bibenzopyran, tetramethyltetraphenyl-, 3168[1].
$C_{46}H_{42}Br_2$ Truxilldiol, tetra p-tolyl-, dibromide, 1391[9].
$C_{46}H_{42}Cl_2$ Truxilldiol, tetra p-tolyl-, dichloride, 1391[9]
$C_{46}H_{44}O_2$ Truxilldiol, tetratolyl-, 1391[8,9]
$C_{46}H_{44}O_6$ Truxilldiol, tetra-p-anisyl-, 1391[9].
$C_{46}H_{46}N_2O_7$ Narcophine, 1270[1]
$C_{46}H_{50}N_4$ Biphenyl, p,p′-bis[p,p′ bis(dimethylamino)benzohydryl]-, 2836[9].
Leucodimalachite green, 2836[9].
$C_{46}H_{52}N_4O_9S$ + $5H_2O$ Butyric acid, β-sulfo-, strychnine salt, 2482[4].
$C_{46}H_{68}O_{40}$ See *Pectic acid*
$C_{46}H_{86}CuO_4$ Δ^3 - 2 - Tricosenone, 4 hydroxy-, Cu deriv., 739[1].
$C_{47}H_{26}Br_2O_{12}S$ Sulfonegallein, dibromo-, tetrabenzoate, 2491[6].
$C_{47}H_{28}O_{12}S$ Sulfonegallein, tetrabenzoate, 2491[4].
$C_{47}H_{44}Br_2O_{16}$ Rottlerin, heptaacetate, dibromide, 182[5].
$C_{47}H_{46}O_{16}$ Rottlerin, heptaacetate, 182[5].
$C_{47}H_{51}AsI_4$ Tribenzylmethylarsonium iodide, CHI_3 addn. compd., 2815[9].
$C_{48}H_{24}O_4$ Isoviolanthrone, bz-2,2 - dibenzoyl-, 3293[4].
Violanthrone, bz-2,2-dibenzoyl, 3293[4].
$C_{48}H_{33}Br_2CrO$ Bis(p - bromophenylphenylphenylphenyl)chromium hydroxide, 2668[4].

$C_{48}H_{34}O_2$ 9,9'-Bixanthyl, 9,9'-bis(1-naphthylmethyl)-, 2328[5].
$C_{48}H_{36}Cl_6N_6O_2Pt$ 12-(p-Acetamidophenyl)-12-α-benzophenazonium chloroplatinate, 602[3].
$C_{48}H_{37}Fe_3N_3O_{14}S$, 1186[7].
$C_{48}H_{48}N_2O_{10}$ Quinine, bisalicylosalicylate, P 2564[2].
$C_{48}H_{47}AlKN_4O_{16}$ Aluminum potassium distrychnine oxalate, 766[6].
$C_{48}H_{80}O_{40}$ Graminin, 2184[3].
$C_{48}H_{91}Cd_2Cl_4NO_{17}P$, 1831[7].
$C_{48}H_{120}O_{18}N_{12}$, 918[1].
$C_{49}H_{32}Br_3CrOS_2$ Bis(p-bromophenylphenylphenylphenyl)chromium hydroxide, CS_2 addn. compd., 2668[5].
$C_{50}H_{32}Cl_4N_2O_2$ Peroxide, bis{1(and 3)-chloro-10-[o(and p)-chlorophenyl]-5,10-dihydro-5-phenyl-5-acridyl}-, 1922[3,4].
$C_{50}H_{34}Cl_2N_2O_2$ Peroxide, bis(3-chloro-5,10-dihydro-5,10-diphenyl-5-acridyl)-, 1992[3].
—, bis[5-(chlorophenyl)-5,10-dihydro-10-phenyl-5-acridyl]-, 1991[9].
$C_{50}H_{52}O_6$ Truxilldiol, tetra-o-phenetyl-, 1391[9].
$C_{50}H_{54}N_4O_4$ Dimalachite green, diacetate, 2836[9].
$C_{50}H_{56}N_8O_9$ 1-Propanone, 3-(3-ethylidene-4-piperidyl)-1-(6-methoxy-4-quinolyl)-, picrolonate, 1993[8].
$C_{50}H_{60}N_4O_{13}S + 8H_2O$ Butyric acid, β-sulfo-, brucine salt, 2482[4].
$C_{50}H_{60}HgI_4N_2$ Quinoline, complex salt with $C_{16}H_{21}I$ and HgI_2, 3695[9].
$C_{51}H_{57}N_6O_{13}P$ Uracylic acid, strychnine salt, 767[9].
$C_{51}H_{58}N_7O_{12}P$ Cytosylic acid, strychnine salt, 767[9].
$C_{51}H_{55}I_{11}N_2$ Tribenzylpropylammonium iodide, CHI_3 addn. compd., 2815[9].
$C_{51}H_{61}Hg_2I_7N_4$ Quinoline, complex salt with $C_5H_{11}I$ and HgI_2, 3695[9].
$C_{52}H_{44}Cl_6N_8Pt$ Flavinduline, 11,12-diamino-, chloroplatinate, 590[9].
$C_{52}H_{42}Cl_6N_8Pt$ 6,7-Diamino-1,2,3-triphenylquinoxalinium chloroplatinate, 591[1].
$C_{52}H_{46}O_2$ Peroxide, bis[diphenyl(p-tolylphenyl)methyl], 1988[4].
$C_{52}H_{57}N_8O_{12}P$ Inosinic acid, strychnine salt, 767[9].
$C_{52}H_{58}N_9O_{11}P$ Adenylic acid, strychnine salt, 767[9].
$C_{52}H_{58}N_9O_{12}P$ Guanylic acid, strychnine salt, 767[9].
$C_{52}H_{65}N_4O_{17}P$ Glucosephosphoric acid, brucine salt, 1979[9].
$C_{52}H_{70}O_{35}S$ Sulfone, 1,1-dicellosyl, tetradecaacetate, 379[7].
$C_{52}H_{76}O_{30}$ Digital, acetyl deriv., 2724[8].
$C_{53}H_{44}N_2O_{11}$ Arabinose, ureide, hexabenzoate, 1596[3].
$C_{53}H_{102}O_6$ Arachin, myristopalmito-, 303[8].
Palmitin, α,γ-di-, β-stearyl-, 2818[9].
$C_{54}H_{38}O_2$ Bibenzopyran, hexaphenyl-, 3167[4].
$C_{54}H_{38}O_4$ Peroxide, bis(triphenylbenzopyranyl), 3167[4].
$C_{54}H_{56}N_7O_{14}$ Diphenic acid, 3,5,5'-trinitro-, quinine salt, 1620[4].
$C_{54}H_{58}ZnO_{10}S_2$ Thymolsulfonephthalein, Zn deriv., 1615[4].
$C_{54}H_{144}Co_2N_{18}O_{18}S_6 + 4H_2O$, 3138[6].
$C_{55}H_{65}N_6O_{17}P$ Uracylic acid, brucine salt, 767[9].
$C_{55}H_{66}N_7O_{16}P$ Cytosylic acid, brucine salt, 767[9].
$C_{55}H_{106}O_6$ Stearin, di-, palmityl-, 2769[1], 2818[9].
$C_{56}H_{26}Br_2S_2$ p-*meso*-Benzodianthrene, 8,8'-dithiobis[16-bromo-, 192[4].
$C_{56}H_{36}CuN_4O_4$ Indigotin, 1,1-diphenyl-, Cu deriv., 414[4].
$C_{56}H_{42}O_2$ Bibenzopyran, dibenzyltetraphenyl-, 3167[7].
—, dimethylhexaphenyl-, 3168[1].
$C_{56}H_{44}O_4$ Truxilldiol, tetraphenyl-, dibenzoate, 1391[7].
$C_{56}H_{65}N_8O_{16}P$ Inosinic acid, brucine salt, 767[9].
$C_{56}H_{66}N_9O_{15}P$ Adenylic acid, brucine salt, 767[9].
$C_{56}H_{66}N_9O_{16}P$ Guanylic acid, brucine salt, 767[9].
$C_{57}H_{30}O_3$ Decacyclene, 3,9,15-tribenzoyl-, 1076[2].
$C_{57}H_{49}N_3O_{14}Zr_3$, 717[7].
$C_{57}H_{110}O_6$ Arachin, palmitostearo-, 303[8].
$C_{58}H_{110}Br_4N_{12}Ni_2O_{16}S_4$ Tristriaminotriethylaminebisnickelous tetra-d-α-bromocamphor-π-sulfonate, 1589[3].
$C_{58}H_{114}N_{12}Ni_2O_{16}S_4$ Tristriaminotriethylaminebisnickelous tetra-d-β-camphorsulfonate, 1589[3].
$C_{59}H_{114}O_6$ Arachin, distearo-, 303[8].
$C_{60}H_{46}O_2$ Peroxide, bis[1-naphthylphenyl(p-tolylphenyl)methyl], 1988[4].
$C_{60}H_{60}N_6O_{16} + 2.5H_2O$ Diphenic acid, 3,5'-dinitro-, dibrucine salt, 1801[2].
$C_{60}H_{80}O_{17}$ Compd. from primary lignin, 1598[9].
$C_{61}H_{78}O_{10}$ Sterol glucoside benzoate, 3100[2].
$C_{62}H_{42}O_2$ Bibenzopyran, dinaphthyltetraphenyl-, 3167[6].
$C_{62}H_{42}O_4$ Peroxide, bis(naphthyldiphenylbenzopyranyl)-, 3167[6].
$C_{63}H_{122}O_6$ Behenin, arachostearo-, 303[9].
—, palmitodi-, 303[9].
$C_{64}H_{58}Mn_4N_2O_{18}$, 717[7].
$C_{64}H_{58}N_2Ni_4O_{18}$, 717[7].
$C_{64}H_{66}O_2$ Stearic acid, cetyl ester, 2818[9].
$C_{65}H_{126}O_6$ Behenin, diaracho-, 303[9].
$C_{66}H_{71}Cl_2Fe_4N_{16}O_{43}$, 1186[9].
$C_{67}H_{130}O_6$ Behenin, arachodi-, 303[9].
$C_{68}H_{56}N_2O_{18}$ d-Glucose, ureide, octabenzoate, 1596[4].
$C_{69}H_{66}AlN_6O_{18} + 10H_2O$ Aluminum strychnine oxalate, 766[5].
$C_{72}H_{66}I_8N_6$ 4,4'-Bipyridinium, 1,1'-dibenzyl-, "two thirds" iodide, 2164[1].
$C_{75}H_{44}O_{16}$ Rottlerin, hexabenzoate, 182[6].
$C_{75}H_{147}Cl_{15}N_{44}Tl$, 156[9].
$C_{77}H_{58}O_{22}$ Acaciin, heptabenzoate, 2162[4].
$C_{82}H_{88}NO_{31}S_4$ Compd. from lignin, p-toluenesulfonyl chloride, and C_5H_5N, 2816[9].
$C_{90}H_{65}Br_6Cr$ Pentakis(p-bromophenylphenylphenyl)chromium bromide, 2668[5].
$C_{101}H_{185}N_5O_{20}PS$ Hypocerebric acid, 768[1].
$C_{102}H_{192}O_{12}$ Inositol, hexapalmitate, 2831[6].
$C_{104}H_{150}O_{80}$, 1342[9].
$C_{118}H_{89}Cl_6Fe_6N_4O_{56}$, 1186[7].
$C_{128}H_{133}Cl_3Fe_3N_{32}O_{31}$, 1186[7].
$CaCl_2$ See *Calcium chloride*.
$CaCl_2O$ See *Bleaching powder*.
$CaCl_2O_2$ See *Calcium hypochlorite*.
CaF_2 See *Calcium fluoride*; *Fluorite*.
$CaF_2H_{12}N_4$ Calcium fluoride compd. with NH_3, 602[9].
CaF_6Si See *Calcium fluosilicate*.
$CaFeO_4 + 2H_2O$ See *Calcium ferrate*.
$CaFe_2O_4$ See *Calcium ferrite*.
$CaHO_4P$ See *Calcium phosphates*; *Monetite*.
CaH_2 See *Calcium hydride*.
CaH_2O_2 See *Calcium hydroxide*.
$CaH_2O_6S_2$ See *Calcium sulfites*.
$CaH_4P_2O_8$ See *Calcium phosphates*.
$CaHg_3$, 1766[5].

$CaHg_3$, 1766^4.
$CaHg_{10}$, 1766^4.
CaI_2O_6 See *Lautarite.*
$CaMn_2O_8$ See *Calcium permanganate.*
$CaMoO_4$ See *Calcium molybdate; Powellite.*
CaN_2O_6 See *Calcium nitrate.*
CaN_6 See *Calcium azide.*
$CaNa_4O_9Si_3$, 3624^2.
CaO See *Lime.*
CaO_3S See *Calcium sulfites.*
CaO_3Si See *Calcium silicates; Wollastonite.*
CaO_3Ti See *Perovskite*
CaO_4S See *Anhydrite; Calcium sulfate; Gypsum.*
CaO_4U Calcium uranate, 3657^3.
CaO_4W See *Scheelite.*
CaO_5SiTi See *Titanite.*
CaO_6S_2 See *Calcium dithionate.*
CaO_7V_2 See *Calcium vanadate.*
$CaO_{12}P_2U_2$ (See also *Autunite*) Calcium uranyl phosphate, 1344^8.
CaP_2 See *Calcium phosphide.*
CaS See *Calcium sulfide.*
$CaSi$ See *Calcium silicides.*
$CaSi_2$ See *Calcium silicides.*
$CaSn$, 1747^6.
$CaSn_3$, 1747^6.
$Ca_2Fe_2O_5$ Calcium ferrite (basic), 1962^9.
$Ca_2HNaO_9Si_3$ See *Pectolite.*
$Ca_2MgO_7Si_2$ See *Akermanite.*
$Ca_2Na_2O_9Si_3$, 3624^2
Ca_2O_4Si (See also *Alite.*) Calcium silicate (basic), 1962^9
Ca_2Si See *Calcium silicides.*
Ca_2Sn, 1747^7.
Ca_3N_2 See *Calcium nitride.*
$Ca_3Na_2O_{14}Si_6$, 3624^2
$Ca_3O_4P_2$ Calcium hypophosphite, 3661^1.
Ca_3O_5Si Calcium silicate (basic), 1962^9.
$Ca_3O_8P_2$ See *Calcium phosphates.*
$Ca_4Cl_2O_{12}P_3Sm$ See *Chlorapatite.*
$Ca_4Cl_4O_4$ + $6H_2O$ Bleaching powder, 880^6.
$CbNaO_3$, 3409^6.
CbO_2 See *Columbium oxides.*
Cb_2FeO_6 See *Columbite, Mossite*
Cb_2O_5 See *Columbium oxides*
$CdCl_2$ See *Cadmium chloride*
$CdCl_2H_3N$, 139^8.
$CdCl_2H_6N_2$, 139^8.
$CdCl_2H_{12}N_4$, 139^8.
$CdCl_2H_{18}N_6$, 139^8.
$CdCl_2H_{30}N_{10}$, 139^8
$CdCl_2O_8$ See *Cadmium perchlorate.*
$CdCl_4Tl_2$, 1767^7
CdF_2 See *Cadmium fluoride.*
$CdF_4FeH_{12}O_6$, 710^7.
CdH_2O_2 See *Cadmium hydroxide*
$CdH_6I_2N_2$, 139^9.
$CdH_8N_2O_7P_2$ + H_2O Ammonium cadmiopyrophosphate, 2794^2
$CdH_8N_2O_8S_2$ Ammonium cadmium sulfate, 531^4, 2960^7.
$CdH_{12}I_2N_4$, 139^9.
$CdH_{12}N_4O_4S$, 2626^4
CdI_2 See *Cadmium iodide*
$CdK_2O_7P_2$ + $3H_2O$ Potassium cadmiopyrophosphate, 2794^2.
$CdMg$, 1166^1, 2812^9.
$CdNa_2O_7P_2$ + $4H_2O$ Sodium cadmiopyrophosphate, 2794^2.
CdO See *Cadmium oxide.*
CdO_4S See *Cadmium sulfate.*
CdO_4U Cadmium uranate, 3657^3
CdS See *Cadmium sulfide*
$CdTe$ See *Cadmium telluride.*
$Cd_3O_{17}V_6$ Cadmium vanadate, 1185^6.
$Cd_3H_6O_9P_3$ + $5H_2O$ See *Cadmium phosphite.*
$CeCl_3$ See *Cerium chlorides.*
$CeCl_4$ See *Cerium chlorides.*
$CeCl_6H_8N_2$ Ammonium ceriochloride, 2925^8.
$CeCuO_6S_2$ + $8H_2O$ Cerium cuprosulfite, 558^7.
$CeCuO_6S_4$ + $8H_2O$ Cerium cuprothiosulfate, 558^8.
CeH_3O_3 See *Cerium hydroxide.*
CeN_3O_9 See *Cerium nitrate.*
CeO_2 See *Cerium oxides.*
CeO_4P, 3658^2.
$Ce_2H_8N_2O_{16}S_4$ + $8H_2O$ Ammonium cerium sulfate, 2960^7.
$Ce_2H_{40}N_{10}O_{32}S_8$ Ammonium cerium sulfate, 2960^7.
$Ce_2K_2O_{16}S_4$ + $2H_2O$ Cerium potassium sulfate, 3401^8.
$Ce_2K_{10}O_{32}S_8$ Cerium potassium sulfate, 3401^8.
$Ce_2Mo_3O_{12}$ See *Cerium molybdate.*
Ce_2O_3 See *Cerium oxides.*
$Ce_2O_{12}S_3$ See *Cerium sulfate.*
$Ce_2O_{34}S_8V_6$ + $15H_2O$ Cerium uranyl sulfate, 558^6.
$Ce_4K_6O_{36}S_9$ + $8H_2O$ Cerium potassium sulfate, 3401^8.
$Ce_4K_{16}O_{60}S_{15}$ Cerium potassium sulfate, 3401^8.
$ClCoH_{12}N_6O_4$, 531^4.
$ClCoH_{15}N_5O_4S$, 2128^7, 3138^8.
$ClCoH_{17}N_6O_8S_2$, 3138^7.
$ClCs$ See *Cesium chloride*
$ClCu$ See *Copper chlorides*
$ClFeO$, 3628^4.
ClH See *Hydrochloric acid.*
$ClHO$ See *Hypochlorous acid.*
$ClHO_3$ See *Chloric acid.*
$ClHO_3S$ See *Chlorosulfonic acid.*
$ClHO_4$ See *Perchloric acid.*
ClH_2HgN, 140^1.
ClH_3HgN, 140^2.
ClH_3Si, 2962^2
ClH_4N See *Ammonium chloride.*
ClH_4NO_4 See *Ammonium perchlorate.*
$ClH_{15}N_5O_4$, 2626^7.
$ClH_{22}N_7O_4$, 2626^7
$ClISn$ Stannous chloroiodide, 1039^8
ClI_2K See *Potassium diiodochloride.*
ClI_2Na See *Sodium diiodochloride*
$ClIr$ See *Iridium chlorides.*
ClK See *Potassium chloride; Sylvite.*
$ClKO$ See *Potassium hypochlorite.*
$ClKO_3$ See *Potassium chlorate*
$ClKO_4$ See *Potassium perchlorate.*
$ClLi$ See *Lithium chloride.*
$ClNO$ See *Nitrosyl chloride.*
$ClNa$ See *Sodium chloride*
$ClNaO$ See *Sodium hypochlorite*
$ClNaO_3$ See *Sodium chlorate.*
$ClNaO_4$ See *Sodium perchlorate.*
ClO_2 See *Chlorine oxides.*
$ClO_{12}Pb_5V_3$ See *Vanadinite.*
$ClPt$ See *Platinum chlorides*
$ClRb$ See *Rubidium chloride*
$ClRh$ See *Rhodium chlorides.*
Cl_2Co See *Cobalt chlorides.*
$Cl_2CoH_{12}N_4O_2$, 531^4.
$Cl_2CoH_{14}N_6O_8$, 2924^7.
$Cl_2CoH_{30}N_{10}$, 139^5.
Cl_2Cr See *Chromium chlorides.*
$Cl_2CrH_{14}N_4O$ + H_2O, 716^9.
Cl_2CrO_2 See *Chromyl chloride.*
Cl_2Cu See *Copper chlorides.*
$Cl_2CuH_6N_2$, 140^4.
$Cl_2CuH_{12}N_4$ + H_2O, 531^4.

$Cl_2CuH_{15}N_5$, 140[4].
$Cl_2CuH_{18}N_6$, 140[4].
$Cl_2CuH_{30}N_{10}$, 140[4].
Cl_2Cu_2 See *Copper chlorides.*
$Cl_2Cu_4H_2O_4$ + $3H_2O$ Basic copper chloride, 1184[4]
Cl_2Fe See *Iron chlorides.*
$Cl_2FeH_{30}N_{10}$, 139[5].
Cl_2FeNO Addn. compd. of $FeCl_2$ and NO, 2455[2].
$Cl_2H_2HgO_4S$, 345[8].
Cl_2H_2Si, 2962[2].
$Cl_2H_3IrO_2$, 3657[5].
$Cl_2H_6HgN_2$, 140[1].
$Cl_2H_6N_2Pt$, 2295[5], 2960[8].
$Cl_2H_8N_2O_2Pt$, 1765[2].
$Cl_2H_{14}N_4O_2Pt$, 1765[5].
$Cl_2H_{24}HgN_8$, 140[1].
$Cl_2H_{30}MnN_{10}$, 139[5].
$Cl_2H_{36}MnN_{12}$, 139[5].
Cl_2Hg See *Mercury chlorides.*
Cl_2Hg_2O Mercury oxychloride, 2798[2].
Cl_2Ir See *Iridium chlorides.*
Cl_2Mg See *Magnesium chloride.*
$Cl_2Mg_4O_3$ + $12H_2O$ Magnesium oxychloride, 3222[4].
Cl_2Mn See *Manganese chloride.*
Cl_2Ni See *Nickel chloride.*
Cl_2O See *Chlorine oxides.*
Cl_2OS See *Thionyl chloride.*
Cl_2O_2S See *Sulfuryl chloride.*
$Cl_2O_{24}P_6Pb_{10}$ See *Pyromorphite.*
$Cl_2O_{24}Pb_{10}V_6$ See *Vanadinite.*
Cl_2Pb See *Cotunnite; Lead chlorides.*
Cl_2Pt See *Platinum chlorides.*
Cl_2Rh See *Rhodium chlorides.*
Cl_2S_2 See *Sulfur chlorides.*
Cl_2Se_2 See *Selenium chlorides.*
Cl_2Sn See *Tin chlorides*
Cl_2Sr See *Strontium chloride.*
Cl_2Te See *Tellurium chlorides.*
Cl_2V See *Vanadium chloride.*
Cl_2Zn See *Zinc chloride.*
Cl_2Zr See *Zirconium chloride.*
$Cl_3CoH_{12}N_4$, 2128[5].
$Cl_3CoH_{15}N_5$, 2128[4].
$Cl_3CoH_{18}N_6$, 531[4], 2781[9].
$Cl_3CoH_{18}N_6O_{12}$, 2924[3].
Cl_3Cr See *Chromium chlorides.*
$Cl_3Cu_{18}N_2O_{22}$ + $19H_2O$ See *Buttgenbachite.*
Cl_3Fe See *Iron chlorides.*
Cl_3FeO_{12} + $9H_2O$ Iron perchlorate, 1769[6].
$Cl_3HI_2K_2Sn$, 25[9].
$Cl_3HI_3K_3Sn$, 25[9].
Cl_3HSi, 2962[2].
Cl_3H_3IrO, 3657[5].
Cl_3HgK Mercury potassium chloride, 3119[2].
Cl_3I Iodine trichloride, 322[9].
Cl_3KMg + $6H_2O$ See *Carnallite.*
Cl_3KPb + $1/_2H_2O$ Lead potassium chloride, 3402[8].
Cl_3N See *Nitrogen chloride.*
Cl_3OP See *Phosphorus oxychloride.*
Cl_3OV See *Vanadium oxytrichloride.*
Cl_3P See *Phosphorus chlorides.*
Cl_3Pt See *Platinum chlorides.*
Cl_3Rh See *Rhodium chlorides.*
Cl_3Sb See *Antimony chlorides.*
Cl_3Ta See *Tantalum chlorides.*
Cl_3Ti See *Titanium chlorides.*
Cl_3Tl See *Thallium chlorides.*
Cl_4Ge See *Germanium chlorides.*
$Cl_4GeH_{16}N_4$, 2795[1].
$Cl_4GeH_{18}N_{16}$, 2795[1].
Cl_4HRu + $2H_2O$, 878[9].
$Cl_4H_8N_2Pt$, 1765[3].
$Cl_4H_8O_8P_4Sn_3$ + $3H_2O$, 1187[6].
$Cl_4H_{10}N_2O_2Pt$, 1765[3].
$Cl_4H_{12}N_4Pt$, 1765[3].
$Cl_4H_{12}N_4Pt_2$ Magnus salt, 2961[4].
$Cl_4H_{14}N_4O_2Pt_2$, 1765[3].
$Cl_4H_{17}Hg_2N_{16}$, 140[1].
Cl_4HgK_2 Mercury potassium chloride, 2459[4].
Cl_4Hg_3O Mercury oxychloride, 2798[8].
Cl_4K_2Pt Potassium platinochloride, 694[9].
Cl_4Ru + $5H_2O$ See *Ruthenium chloride.*
Cl_4Se See *Selenium chloride.*
Cl_4Si See *Silicon tetrachloride.*
Cl_4Sn See *Tin chlorides.*
Cl_4Te See *Tellurium chlorides.*
Cl_4Ti See *Titanium chlorides.*
Cl_4U See *Uranium chloride.*
Cl_4Zr See *Zirconium chlorides.*
Cl_5Cs_2Tl + $2H_2O$, 1767[1].
$Cl_5H_2K_2ORu$, 878[9].
$Cl_5H_{10}N_2ORu$, 878[9].
Cl_5KPb_2 Lead potassium chloride, 3402[8].
Cl_5P See *Phosphorus chlorides.*
Cl_5Sb See *Antimony chlorides.*
Cl_5Ta See *Tantalum chlorides.*
Cl_6Cs_3Tl, 1767[1]
$Cl_6Cu_2H_{30}N_{10}$, 140[4].
Cl_6H_2Pt See *Chloroplatinic acid.*
$Cl_6H_4Hg_3N_2O_2Rh$, 2625[9].
$Cl_6H_{12}IrN_3$ + H_2O, 3659[7].
$Cl_6H_{12}N_3Ru$ + H_2O, 878[9].
$Cl_6H_{18}N_6Pt_2$, 2961[4].
Cl_6IrK_3 Potassium chloroiridate, 694[8], 695[1,2].
Cl_6IrNa_3 See *Sodium chloroiridite.*
Cl_6K_2Pd See *Potassium chloropalladate.*
Cl_6K_2Pt See *Potassium chloroplatinate.*
Cl_6K_3Ru + H_2O, 878[9].
Cl_6Na_2Pt Sodium chloroplatinate, 694[9], 695[1], 1344[8]
Cl_6Na_3Rh Sodium chlororhodite, 694[8], 695[1].
Cl_6Na_3Ru Sodium chlororuthenite, 878[8,9].
$Cl_7CoH_{15}Hg_2N_5$, 2128[7].
$Cl_9Cs_3Tl_2$, 1767[1]
$Cl_{10}K_4Ru_2$ + $3H_2O$ Potassium chlororutheniates, 3139[8]
$Cl_{12}H_{32}N_8O_4Rh_2$, 2625[7].
CoF_2 See *Cobalt fluoride.*
$CoF_2H_{17}N_5O$, 2924[3].
$CoF_3H_{17}N_5O$, 2924[3].
$CoF_3H_{20}N_6O$, 2924[3]
$CoF_3H_{23}N_6O$, 2924[3].
$CoF_3H_{26}N_8O$, 2924[3].
$CoFeO_4$ See *Cobalt ferrate.*
CoH_2 See *Cobalt hydride.*
CoH_2O_2 See *Cobalt hydroxides.*
$CoH_2O_4S_2$ + $6H_2O$, 1767[7].
CoH_3O_3 See *Cobalt hydroxides.*
$CoH_4N_4NaO_2$, 531[6].
$CoH_8N_2O_8S_2$ Ammonium cobalt sulfate, 531[6], 2960[7].
$CoH_8N_2O_8Se_2$ + $2H_2O$ and $6H_2O$ Ammonium cobalt selenate, 347[6].
$CoH_9N_3O_6$, 531[6], 2128[4].
$CoH_{12}MoN_4O_7$ + $5H_2O$, 1962[3].
$CoH_{12}MoN_4O_8$ + $5H_2O$, 1962[4].
$CoH_{15}N_7O_4$, 2128[4].
$CoH_{16}N_4O_{12}Se_2$ + $4H_2O$, 3138[9].
$CoH_{16}Mo_6N_4O_{24}$ + $3H_2O$, 1962[8].
$CoH_{16}N_4O_{11}S_2$, 3138[9].
$CoH_{18}N_6O_4P$, 2924[6].
$CoH_{18}N_6O_4S$, 2620[6], 2924[3].
$CoH_{18}N_7O_6$, 2924[3].
$CoH_{18}N_8O_9$, 2924[3].

$CoK_2O_8Se_2 + 2H_2O$ and $6H_2O$ Cobalt potassium selenate, 347[5].
CoN_2O_4 See *Cobalt nitrite.*
CoN_2O_6 See *Cobalt nitrate.*
$CoN_6Na_3O_{12}$, 531[4].
CoO See *Cobalt oxides.*
CoO_2 See *Cobalt oxides.*
CoO_4S See *Cobalt sulfate.*
CoO_4U Cobalt uranate, 3657[3].
$CoO_{12}P_2U_2$, 1344[8].
CoS See *Cobalt sulfide.*
$CoTe$ Cobalt telluride, 882[1].
$Co_2H_{51}N_9O_{18}S_3$, 155[9].
$Co_2H_{24}Mo_3N_8O_{12} + 3H_2O$, 1962[3].
$Co_2H_{24}Mo_5N_8O_{18} + 4H_2O$, 1962[4]
$Co_2H_{24}Mo_7N_8O_{24} + 6H_2O$, 1962[3].
$Co_2H_{24}N_6O_{13}S_2 + H_2O$, 155[9].
$Co_2H_{28}N_8O_{14}SSe_2$, 3138[5], 3139[1].
$Co_2H_{28}N_8O_{14}S_2Se + 4H_2O$, 3138[5].
$Co_2H_{28}N_8O_{14}S_3$, 3139[1].
$Co_2H_{28}N_8O_{14}Se_3$, 3139[1]
$Co_2H_{32}Mo_3N_8O_{15}$, 1962[3].
$Co_2H_{32}Mo_6N_8O_{25}$, 1962[3]
$Co_2H_{34}Mo_3N_{10}O_{14}$, 1962[5].
$Co_2H_{34}Mo_7N_{10}O_{26} + 5H_2O$, 1962[5].
$Co_2H_{34}Mo_9N_{10}O_{32} + 9H_2O$, 1962[4].
$Co_2H_{34}N_{10}O_{18}Se_4$, 3138[4].
$Co_2H_{36}N_{12}O_{12}S_2$, 2924[3].
$Co_2O_{17}V_6$ Cobalt vanadate, 1185[5].
$Co_3H_4K_2O_{12}P_4 + 32H_2O$ Potassium cobaltophosphite, 2794[1]
$Co_3H_{12}N_2O_{12}P_4 + 18H_2O$ Ammonium cobaltophosphite, 2794[1].
$Co_3N_{12}Nd_2O_{36} + 24H_2O$ Cobalt neodymium nitrate, 3258[1]
$Co_3N_{12}O_{36}Pr_2 + 24H_2O$ Cobalt praseodymium nitrate, 3258[1].
$Co_3O_8P_2$ See *Cobalt phosphate.*
$Co_4H_{12}Mo_3N_{12}O_{18}$, 1962[4].
$Co_{10}H_{100}Mo_3N_{40}O_{57}$, 1962[3]
$CrFe_2O_4$ Chromium ferrite, 1939[9]
$CrH_2KO_6P_2 + 12H_2O$ Potassium chromiphosphite, 2793[8]
$CrH_2NaO_6P_2 + 14H_2O$ Sodium chromiphosphite, 2793[8]
CrH_2O_4 See *Chromic acid*
CrH_3 See *Chromium hydride*
CrH_3O_3 See *Chromium hydroxides*
$CrH_6NO_6P_2 + 8H_2O$ Ammonium chromiphosphite, 2793[8].
$CrH_8N_2O_4$ See *Ammonium chromate.*
$CrH_{18}I_2N_6O + 1.5H_2O$, 716[9].
$CrH_{18}N_6O_4S$, 716[8].
$CrH_{18}N_7O_3 + 1.5H_2O$, 716[9]
CrK_2O_4 See *Potassium chromate.*
CrN_3O_9 See *Chromium nitrates.*
$CrNa_2O_4$ See *Sodium chromate.*
CrO_3 See *Chromium oxides.*
CrO_4Pb See *Crocoite, Lead chromates.*
Cr_2FeO_4 See *Chromite.*
$Cr_2Fe_2O_{13}$ See *Chromium ferrate.*
$Cr_2H_2O_7$ See *Dichromic acid.*
$Cr_2H_8N_2NiO_8 + 2H_2O$ and $6H_2O$ Ammonium nickel chromate, 347[5]
$Cr_2H_{14}N_4O_8$, 716[9].
$Cr_2K_2O_7$ See *Potassium dichromate*
$Cr_2Na_2O_7$ See *Sodium dichromate.*
Cr_2O_3 See *Chromium oxides*
$Cr_2O_{12}U_3$ Chromium uranate, 3657[3].
Cr_2S_3 See *Chromium sulfide.*
Cr_3HO_8 Chromium dichromate, 718[1].
$Cr_3La_2O_{12}$ See *Lanthanum chromate*
$Cr_3Nd_2O_{12}$ See *Neodymium chromate.*
$Cr_3O_{12}Sm_2$ See *Samarium chromate.*
$Cr_4Fe_2O_{15}$ Iron dichromate, 718[1].
$Cr_4K_2O_{16}S_2 + H_2O$, 2959[8].
$Cr_4K_2O_{32}Si_{12}$ Potassium chromosilicate, 1364[9].
Cr_5O_9 See *Chromium oxides.*
Cr_5O_{12}, 1569[8].
Cr_5O_{18}, 1569[8].
$Cr_6H_{24}La_2N_6O_{24} + 5H_2O$ Ammonium lanthanum chromate, 1963[6].
Cr_6MoO_{21} Molybdenum dichromate, 718[1].
Cr_6O_{15} Chromium dichromate, 717[9].
Cr_8O_{21} Chromium dichromates, 717[9].
CsF See *Cesium fluoride.*
CsI See *Cesium iodide.*
CsI_3Sn, 345[5].
CsI_5Sn_2, 1570[9].
CsI_6Sn, 345[6].
$CsNO_3$ See *Cesium nitrate.*
$Cs_2CuO_8Se_2 + 2H_2O$ and $6H_2O$ Cesium copper selenate, 347[5].
$Cs_2NiO_8Se_2 + 2H_2O$ and $6H_2O$ Ce nickel selenate, 347[5].
Cu-Au, 1154[8].
CuF_2 See *Copper fluoride.*
$CuFeO_4$ See *Copper ferrate.*
$CuFeS_2$ See *Chalcopyrite; Copper-iron sulfide.*
$CuFe_2S_3$ See *Cubanite.*
CuH See *Copper hydride.*
$CuHO_3P + 2H_2O$ See *Copper phosphites.*
CuH_2O_2 See *Copper hydroxides.*
$CuH_2O_8S_2 + 6H_2O$, 1767[7].
$CuH_8N_2O_8S_2$ Ammonium copper sulfate, 531[4], 2960[7].
$CuH_8N_2O_8Se_2 + 2H_2O$ and $6H_2O$ Ammonium copper selenate, 347[5].
$CuH_{12}N_4O_4S + H_2O$, 531[4].
$CuH_{15}I_2N_5$, 140[5].
$CuH_{15}N_5O_4S$, 2626[4].
$CuH_{18}I_2N_6$, 140[5].
$CuH_{30}I_2N_{10}$, 140[5].
CuI See *Copper iodide.*
$CuK_2O_8Se_2 + 2H_2O$ and $6H_2O$ Copper potassium selenate, 347[5].
$CuLaO_6S_2 + 8H_2O$ Lanthanum cuprosulfite, 558[7].
$CuLaO_6S_4 + 8H_2O$ Lanthanum cuprothiosulfate, 558[8]
CuN_2O_6 See *Copper nitrates.*
$CuNdO_6S_2 + 8H_2O$ Neodymium cuprosulfite, 558[7].
$CuNdO_6S_4 + 8H_2O$ Neodymium cuprothiosulfate, 558[8].
CuO See *Copper oxides.*
CuO_4S See *Copper sulfates.*
CuO_4U Copper uranate, 3657[3].
$CuO_6PrS_2 + 8H_2O$ Praseodymium cuprosulfite, 558[7]
$CuO_6PrS_4 + 8H_2O$ Praseodymium cuprothiosulfate, 558[8].
CuO_6S_2 See *Copper dithionate.*
$CuO_6S_4Th + 8H_2O$ Thorium cuprothiosulfate, 558[8].
$CuO_8Rb_2Se_2 + 2H_2O$ and $6H_2O$ Copper rubidium selenate, 347[5].
$CuO_8Se_2Tl_2 + 2H_2O$ and $6H_2O$ Copper thallium selenate, 347[5].
$CuO_{12}P_2U_2$, 1344[8].
CuS See *Copper sulfides; Covellite.*
$CuSn$, 2812[8], 3440[4].
$CuZn_3$, 1209[3].
$CuZn_4$, 1209[3].
Cu_2FeS_4Sn See *Stannite.*
$Cu_3H_2K_4NO_8S_6$, 1767[4].
$Cu_3H_4N_3Na_2O_8S_4$, 1767[4].
Cu_2I_2 See *Copper iodide.*

$Cu_2K_2O_6S_4 + 2H_2O$, 1767^4.
$Cu_2K_4O_9S_6$, 1767^4.
$Cu_2Na_2S_2$ Copper sodium sulfide, 886^1.
Cu_2O See *Copper oxides.*
$Cu_2O_9S_4Zr + 30H_2O$ Zirconium cuprothiosulfate, 558^9.
$Cu_2O_{17}V_6$ Copper vanadate, 1185^5.
$Cu_2O_{31}V_{10} + 5H_2O$ Copper vanadate, 1185^6.
Cu_2S See *Chalcocite; Copper sulfides.*
Cu_2Te See *Copper telluride.*
Cu_2Zn_3, 1209^3.
Cu_3Au, 1154^8.
$Cu_3F_{12}Fe_2H_{24}O_{18}$, 719^7.
$Cu_3H_2O_{10}S_2 + 4H_2O$ Copper sulfates (basic), 3401^6.
$Cu_3H_4O_8S$ See *Antlerite.*
$Cu_3H_{30}I_6N_{10}$, 140^5.
Cu_3S See *Domite.*
Cu_3Sn, 2812^8, 3440^4.
$Cu_4H_2N_2O_{10} + 2H_2O$ Basic copper nitrate, 1184^4.
$Cu_4H_2O_8S + 3H_2O$ Basic copper sulfate, 1184^4.
$Cu_4H_6O_{10}S$ See *Brochantite.*
$Cu_4O_7S + 4H_2O$, 2295^1.
Cu_4SN, 1209^3, 2812^8.
Cu_5FeS_4 See *Bornite.*
$Cu_6H_6O_{14}S_2$ Copper sulfates (basic), 3401^7.
$Cu_8S_7Sb_2$ See *Tetrahedrite.*
$Cu_{10}Na_8O_{27}S_{11} + 9H_2O$, 1767^3.

$Dy_2O_{12}S_3$ Dysprosium sulfate, 2112^4.

ErH_3O_3 See *Erbium hydroxide.*
$Er_2O_{12}S_3$ Erbium sulfate, 2112^4.
$Eu_2O_{12}S_3$ Europium sulfate, 2112^4.

FH See *Hydrofluoric acid.*
FH_4N See *Ammonium fluoride.*
FK See *Potassium fluorides*
FKO_3S Potassium fluorosulfonate, 2293^9.
FLi See *Lithium fluoride.*
FNa See *Sodium fluoride*
FRb See *Rubidium fluoride.*
FTl See *Thallium fluoride.*
F_2Fe See *Iron fluorides.*
F_2HK See *Potassium fluorides.*
F_2HNa See *Sodium fluorides.*
F_2H_2 See *Hydrofluoric acid.*
F_2Mg See *Magnesium fluoride.*
F_2Mn See *Manganese fluoride.*
F_2Ni See *Nickel fluoride.*
F_2Pb See *Lead fluoride.*
F_2Sr See *Strontium fluoride.*
F_2Zn See *Zinc fluoride.*
F_3Fe See *Iron fluorides.*
F_3Sb See *Antimony fluoride.*
F_4FeH_4N Ammonium tetrafluoferrate, 719^6.
F_4FeK Potassium tetrafluoferrate, 719^6.
F_4Si See *Silicon tetrafluoride.*
F_4Zr See *Zirconium fluorides.*
$F_5FeH_2OTl_2 + 2H_2O$ Thallium pentafluoaquoferrate, 719^7.
F_6H_2Si See *Fluosilicic acid.*
$F_6H_2Zr + 3H_2O$ Hydrofluozirconic acid, 2466^9.
$F_6H_8HfN_2$ Ammonium fluohafnate, 3658^4.
$F_6H_8N_2Si$ See *Cryptohalite.*
$F_6H_8N_2Ti$ Ammonium fluotitanate, 3658^3.
$F_6H_8N_2Zr$ Ammonium fluozirconate, 3658^4.
F_6K_2Si See *Potassium fluosilicate.*
F_6Na_2Si See *Sodium fluosilicate.*
F_6Na_2Ti Sodium fluotitanate, 1499^9.
$FeHNa_2O_8P_2$ Sodium hydroxyferripyrophosphate, 2793^9.
FeH_2 See *Iron hydrides.*
$FeH_2Na_2O_8P_2 + 4H_2O$ Sodium dihydroxyferripyrophosphate, 2793^9.
FeH_2O_2 See *Iron Hydroxides.*
FeH_2O_4 See *Ferric acid.*
$FeH_2O_8S_2 + 6H_2O$, 1767^7.
$FeH_3K_2O_7P_2 + 20H_2O$ Potassium hydroxyferriphosphite, 2793^9.
$FeH_3Na_2O_7P_2 + 20H_2O$ Sodium hydroxyferriphosphite, 2793^9.
FeH_3O_3 See *Iron hydroxides.*
FeH_6 See *Iron hydrides.*
$FeH_8N_2O_7P_2 + 2H_2O$ Ammonium ferropyrophosphate, 2794^3.
$FeH_8N_2O_8S_2$ Ammonium iron sulfate, 531^4, 2775^7, 2798^8, 2960^7.
$FeH_{11}N_2O_7P_2 + 8H_2O$ Ammonium hydroxyferriphosphite, 2793^9.
$FeH_{14}N_4O_4S$, 2626^4.
$FeHg_2O_4$ See *Mercury ferrate.*
FeI_2 See *Iron iodides.*
$FeKN_2O_3S$, 2455^4.
$FeKN_2O_6S_2$, 2455^4.
$FeKO_8S_2 + 12H_2O$ See *Alums.*
FeK_2O_4 See *Potassium ferrate.*
$FeNO_4S$ Addn. compd. of $FeSO_4$ and NO, 2455^2.
$FeNO_4Se$ Addn. compd. of $FeSeO_4$ and NO, 2455^2.
$FeNaO_6Si_2$ Sodium iron silicate, 29^8.
$FeNa_2O_7P_2$ See *Sodium ferropyrophosphate.*
$FeNa_2S_2$ Iron sodium sulfide, 886^1.
$FeNiO_4$ See *Nickel ferrate*
$FeNi_3$, 893^3
FeO See *Iron oxides.*
FeO_3Si See *Grunerite, Iron silicates.*
FeO_3Ti See *Ilmenite.*
FeO_4P See *Iron phosphates.*
FeO_4Pb See *Lead ferrate.*
FeO_4S See *Iron sulfates.*
FeO_4Sr See *Strontium ferrate.*
FeO_4Zn See *Zinc ferrate*
FeS See *Iron sulfides; Troilite.*
FeS_2 See *Pyrite.*
$FeSi_2$ See *Iron silicide.*
$FeTe$ Iron telluride, 882^1.
Fe_2MgO_4 Magnesium ferrite, 698^8, 1939^9.
Fe_2Ni, 893^3.
Fe_2NiO_4 Nickel ferrite, 1939^9
Fe_2O_3 See *Goethite; Hematite; Iron oxides; Xanthosiderite*
Fe_2O_4 See *Iron ferrates*
Fe_2O_4Pb Lead ferrite, 1939^9.
Fe_2O_4Si Compd. of FeO and SiO_2, 1020^6.
Fe_2O_4Zn Zinc ferrite, 1939^9.
Fe_2O_5Ti See *Pseudobrookite.*
$Fe_2O_7P_2 + 5H_2O$, 1364^4.
$Fe_2O_8P_2 + 4H_2O$, 1364^4.
Fe_2O_4Th See *Thorium ferrate.*
$Fe_2O_{12}S_3$ See *Iron sulfates; Kornelite.*
$Fe_2O_{11}U_3$ Iron uranate, 3657^3.
Fe_2Ni_3, 893^3.
Fe_3O_4 See *Iron oxides; Magnetite.*
$Fe_3O_8P_2$ See *Vivianite.*
$Fe_4H_6O_9$ See *Limonite.*
$Fe_4KN_7O_7S_3$, 2455^4.
Fe_4O_7Pb See *Magnetoplumbite.*
Fe_5O_{11} See *Iron ferrates.*
$Fe_7H_6O_{16}P_4 + 8H_2O$ See *Ludlamite.*

Ga_2O_3 See *Gallium oxide.*
$Ga_2O_{12}S_3$ See *Gallium sulfate.*
$Gd_2O_{12}S_3$ Gadolinium sulfate, 2112^4.
GeI_4 See *Germanium iodides.*

GeO See *Germanium oxides.*
GeO_2 See *Germanium oxides.*

HHg See *Mercury hydrides.*
HI See *Hydriodic acid.*
HIO See *Hypoiodous acid.*
HIO_3 See *Iodic acid.*
HIO_4 See *Periodic acid.*
HI_2KO_6 See *Potassium iodates.*
HKO See *Potassium hydroxide.*
HKO_4S See *Potassium sulfates.*
HKO_3S, 1573^3.
HKO_7SeU + H_2O, 3140^1.
$HLiO$ See *Lithium hydroxide.*
$HMnO_4$ See *Permanganic acid.*
HNO_2 See *Nitrous acid.*
HNO_3 See *Nitric acid.*
HNO_5S Nitrosylsulfuric acid, 3142^8, 3662^5.
HN_3 See *Hydrazoic acid.*
$HNaO$ See *Sodium hydroxide.*
$HNaO_3S$ See *Sodium sulfites.*
$HNaO_4S$ See *Sodium sulfates.*
$HNaS$ See *Sodium hydrosulfide.*
HNa_2O_4P See *Sodium phosphates*
HO_3P See *Metaphosphoric acid.*
HO_3PPb See *Lead phosphites.*
HO_3V See *Metavanadic acid*
HO_4PPb See *Lead phosphates.*
HO_4PSn See *Tin phosphates.*
HO_5S Persulfuric acid, 1695^5.
HO_8STl + $2H_2O$, 1767^9.
HZn See *Zinc hydrides.*
H_2HgO_2 See *Mercury hydroxides.*
H_2IrO + $2H_2O$, 3657^5.
H_2I_2IrO, 3657^5
$H_2I_4O_{14}U$ Uranium iodate (acid), 3139^6.
H_2KN See *Potassium amide*
H_2KO_4P See *Potassium phosphates.*
$H_2K_2O_8P_2U$ Potassium uranyl phosphite 793^3.
$H_2K_4O_{14}S_3U$ + $6H_2O$, 3140^8.
H_2Mg See *Magnesium hydride.*
H_2MgO_2 See *Magnesium hydroxides.*
$H_2MgO_8S_2$ + $6H_2O$, 1767^7.
H_2MnO_2 See *Manganese hydroxides.*
$H_2MnO_8S_2$ + $6H_2O$, 1767^7.
H_2MoO_4 See *Molybdic acid.*
H_2NNa See *Sodium amide.*
[illegible]O_5Se Nitroselenic acid, 1573^2
[illegible]$_2O_3$ Nitrohydroxylamic acid, 2625^3.
$H_2N_2O_2$ Nitramine, 538^7.
$H_2N_2O_5$ Nitrosic acid, 3619^7.
$H_2N_2O_3$ E acid, 1938^6.
H_2NaO_2P See *Sodium hypophosphites.*
H_2NaO_4P See *Sodium phosphates.*
$H_2Na_2O_8P_2U$ Sodium uranyl phosphite, 793^7.
$H_2Na_4O_{14}Se_3U$ + H_2O, 3140^1
H_2Ni See *Nickel hydride.*
H_2NiO_2 See *Nickel hydroxide*
$H_2NiO_8S_2$ + $6H_2O$, 1767^7
H_2O See *Water.*
H_2O_2 See *Hydrogen peroxide*
H_2O_2Pb See *Lead hydroxide.*
H_2O_3Sn See *Tin acids, Tin hydroxides*
H_2O_2Zn See *Zinc hydroxide.*
H_2O_3S See *Sulfurous acid.*
$H_2O_3S_2$ See *Thiosulfuric acid.*
H_2O_3Se See *Selenious acid.*
H_2O_3Te Tellurous acid, 694^4
H_2O_3Ti See *Titanic acid.*
H_2O_4S See *Sulfuric acid.*
H_2O_4Se See *Selenic acid.*
H_2O_4Te + $2H_2O$ Telluric acid, 694^4.
H_2O_4W See *Tungstic acid.*
$H_2O_6P_2U$ + $4H_2O$ Uranium phosphite, 3139^6.
$H_2O_6S_2$ See *Dithionic acid.*
$H_2O_6S_3$ See *Trithionic acid.*
$H_2O_6S_4$ See *Tetrathionic acid.*
$H_2O_6S_5$ See *Pentathionic acid.*
H_2O_7SeU + $2H_2O$, 3139^8.
$H_2O_8S_2$ See *Persulfuric acid.*
$H_2O_8S_2Zn$ + $6H_2O$, 1767^7.
H_2Pb_2 Lead hydride, 880^2.
H_2Pd_4 See *Palladium hydrides.*
H_2S See *Hydrogen sulfide.*
H_2Sb_2 Antimony hydride, 880^2.
H_2Se See *Hydrogen selenide.*
H_2Sn_2 See *Tin hydrides.*
$H_3Hg_2NO_2$ Millon's base, 1031^4.
H_3LaO_3 See *Lanthanum hydroxide.*
H_3N See *Ammonia.*
H_3NO See *Hydroxylamine.*
H_3NO_3S Sulfamic acid, 1926^5.
H_3NdO_3 See *Neodymium hydroxide.*
H_3O_2P See *Hypophosphorous acid.*
H_3O_3Pr Praseodymium hydroxide, 27^2.
H_3O_3Ru See *Ruthenium hydroxide.*
H_3O_3Sm Samarium hydroxide, 27^2.
H_3O_3Yt See *Yttrium hydroxide.*
H_3O_4P See *Phosphoric acid.*
H_3O_4Sb See *Antimonic acid.*
$H_3O_9P_2Zn_3$ + $8H_2O$ See *Zinc phosphites.*
H_3P See *Phosphine.*
H_3Sb See *Stibine.*
$H_4K_2Ni_2O_{12}P_4$ + $32H_2O$ Potassium nickelophosphite, 2794^1.
$H_4K_2O_{12}S_2U$ + $2H_2O$, 3140^3.
$H_4K_2O_{12}Se_2U$ + H_2O, 3140^1.
H_4LiNO_4S Ammonium lithium sulfate, 3117^2.
H_4MgNO_4P Ammonium magnesium phosphate, 719^3, 2107^5.
$H_4NO_8S_2V$ Ammonium vanadium sulfate, 2626^2.
H_4N_2 See *Hydrazine.*
$H_4N_2O_2$ See *Ammonium nitrite.*
$H_4N_2O_3$ See *Ammonium nitrate.*
$H_4N_2O_6S_2$ Hydrazinedisulfonic acid, 1571^5.
H_4N_4 See *Ammonium azide.*
H_4O_4Si See *Orthosilicic acid*
H_4O_4Sn See *Tin acids.*
H_4O_4Th See *Thorium hydroxide.*
H_4O_4Zr See *Zirconium hydroxide.*
$H_4O_7P_2$ See *Pyrophosphoric acid.*
$H_4O_8P_2Sn$ See *Tin phosphates.*
H_4Si See *Silicon hydrides.*
$H_5F_4O_2Se$, 1186^5.
$H_5KO_{12}S_3U$, 3140^3.
H_5NO See *Ammonium hydroxide.*
H_5NO_4S See *Ammonium sulfates.*
H_5NO_7SeU + H_2O, 3140^1.
H_5N_3 See *Triazane.*
$H_5O_8P_2U$ + $2.5H_2O$ Uranium phosphite (acid), 3139^6.
$H_6HgI_2N_2$, 140^1
H_6KN_3Sn Potassium ammonostannite, 720^9.
H_6NO_4P See *Ammonium phosphates.*
H_6N_2O See *Hydrazine*, hydrate.
H_6N_3NaSn Sodium ammonostannite, 720^9.
$H_6N_2O_2Pt$, 2961^7.
H_6OSi_2, 2962^2.
$H_6O_3Si_6$ See *Siloxene.*
H_6O_6Te Allotelluric acid, 694^9.
Telluric acid, 3598^4
H_6O_6U Uranium hydroxides, 27^3.
$H_6O_{11}Se_2U$ + $2H_2O$, 3139^9.
$H_6O_{14}Se_3U_2$ + $7H_2O$, 3139^9.
H_6Si_2 See *Silicon hydrides.*
$H_7K_2N_2O_{11}SU$, 3140^8.
$H_8MgN_2O_8S_2$ Ammonium magnesium sulfate, 531^4, 2960^7.

$H_8MnN_2O_8S_2$ Ammonium manganese sulfate, 531[4], 2960[7].
$H_8MoN_2O_4$ See *Ammonium molybdate.*
$H_8N_2Na_4O_{16}Se_4U$ + $10H_2O$, 3140[3].
$H_8N_2NiO_8S_2$ Ammonium nickel sulfate, 531[4], 2960[7].
$H_8N_2NiO_8Se_2$ + $2H_2O$ and $6H_2O$ Ammonium nickel selenate, 347[5].
$H_8N_2O_3S$ See *Ammonium sulfites.*
$H_8N_2O_4S$ See *Ammonium sulfate.*
$H_8N_2O_4W$ Ammonium tungstate, 3656[7].
$H_8N_2O_5S_2$ See *Ammonium metabisulfite.*
$H_8N_2O_6S_2$ See *Ammonium dithionate.*
$H_8N_2O_8S_2$ See *Ammonium persulfate.*
$H_8N_2O_8S_2Zn$ Ammonium zinc sulfate, 531[4], 2960[7].
$H_8N_2O_8Se_2Zn$ + $2H_2O$ and $6H_2O$ Ammonium zinc selenate, 347[5].
H_8N_2S See *Ammonium sulfide.*
H_8N_2Se See *Ammonium selenide.*
$H_8O_8P_4U$ Uranium hypophosphite, 3139[7].
H_8Si_3 See *Silicon hydrides.*
H_9NSi_3, 2962[2].
$H_9N_2O_4P$ See *Ammonium phosphates.*
$H_9N_3O_7S$, 2797[4].
$H_9N_3O_4Pt$, 2961[8].
$H_{10}N_2O_8P_2U$ Ammonium uranyl phosphite, 2793[7].
$H_{10}Si_4$ See *Silicon hydrides.*
$H_{11}O_{16}P_6U$ Uranium hypophosphite (acid), 3139[7].
$H_{12}HgN_4O_4S$, 2626[4].
$H_{12}Hg_2I_6N_4$, 140[1].
$H_{12}N_2Ni_3O_{12}P_4$ + $18H_2O$ Ammonium nickelophosphite, 2794[1].
$H_{12}N_3O_4P$ See *Ammonium phosphate.*
$H_{12}N_4O_4SSn$, 2626[4].
$H_{12}N_4O_4Pt$, 2961[8].
$H_{12}N_4O_4SZn$, 2626[4].
$H_{14}Mo_2N_4O_{21}V_4$ + $8H_2O$ Ammonium molybdovanadate, 558[2].
$H_{16}Mo_6N_4O_{27}V_4$ + $10H_2O$ Ammonium molybdovanadate, 558[1].
$H_{16}HgI_2N_6$, 140[1].
$H_{18}IKN_6$ Potassium iodide compd. with NH_3, 692[7].
$H_{16}MnN_6O_4S$, 2626[4].
$H_{16}N_4O_{17}S_3U$ + $3H_2O$, 3140[3].
$H_{16}N_6NiO_4S$, 2626[4].
$H_{24}Mo_7N_6O_{24}$ + $4H_2O$, 2294[1].
$H_{32}Mo_6N_8O_{34}V_6$ + $10H_2O$ Ammonium molybdovanadate, 558[1].
$H_{32}Mo_6N_8O_{32}V_4$ + $6H_2O$ Ammonium molybdovanadate, 558[2].
$H_{36}HgI_2N_{12}$, 140[1].
$H_{48}N_{14}Na_4O_{138}W_{40}$ + $50H_2O$, 1039[1].
$HeHg_{?}$ See *Mercury helide.*
He_2W Tungsten helide, 145[4], 1928[1].
$He_{10}Hg$ Mercury helide, 2127[6].
HfO_8S_2 See *Hafnium sulfate.*
$Hf_3O_{16}P_4$. See *Hafnium phosphate.*
HgI_2 See *Mercury iodides.*
HgI_4K_2 Mercury potassium iodide, 2935[9].
$HgNO_3$ See *Mercury nitrates.*
HgO_4S See *Mercury sulfates.*
HgO_4U Mercury uranate, 3657[3].
HgS See *Mercury sulfides; Cinnibar; Metacinnabarite.*
$HgTe$ See *Mercury tellurides.*
$Hg_2I_7K_3$ Mercury potassium iodide, 2935[9].
$Hg_3La_2N_{18}O_{54}$ + $24H_2O$ Lanthanum mercury nitrate, 1963[9].
$Ho_2O_{12}S_3$ Holmium sulfate, 2112[4].

IIr, 3657[6].
IK See *Potassium iodides.*
IKO_3 See *Potassium iodate.*
INa See *Sodium iodide.*
IRb See *Rubidium iodide.*
I_2O_7U Uranium iodate (basic), 3139[8].
I_2Pb See *Lead iodide.*
I_2Pt See *Platinum iodides.*
I_2Sn See *Tin iodides.*
I_2Zn See *Zinc iodide.*
I_3Ir, 3657[5].
I_3K See *Potassium iodides.*
I_3KPb + $2H_2O$ Lead potassium iodide, 3402[8].
I_3KSn + $3H_2O$ K Sn iodide, 25[8].
I_3Pt See *Platinum iodides.*
I_3RbSn Rubidium tin iodide, 345[5].
$I_4O_{12}U$ Uranium iodate, 3139[8].
I_4Pt See *Platinum iodides.*
I_4Sn See *Tin iodides.*
I_5RbSn_2 Rubidium tin iodide, 315[5], 1570[9].
I_6K_2 See *Potassium iodides.*
I_6RbSn Rubidium tin iodide, 345[6].
IrO_2 See *Iridium oxide.*

$KMnO_4$ See *Potassium permanganate.*
KNO_2 See *Potassium nitrite.*
KNO_3 See *Potassium nitrate.*
KN_3 Potassium azide, 318[1].
KO_3P See *Potassium metaphosphate.*
KO_6UV See *Carnotite.*
KO_8S_2V Potassium vanadium sulfate, 2626[4].
$K_2MgO_8S_2$ Magnesium potassium sulfate, 347[1].
K_2MnO_4 See *Potassium manganate.*
$K_2N_2O_6S_2$ Potassium azodisulfonate, 1571[5].
$K_2N_4O_{12}Pb$ Lead potassium nitrate, 879[9].
$K_2NiO_8Se_2$ + $2H_2O$ and $6H_2O$ Nickel potassium selenate, 347[5].
K_2O_2 See *Potassium oxides.*
K_2O_3 See *Potassium oxides.*
K_2O_3Te Potassium tellurite, 1645[7].
K_2O_4 See *Potassium oxides.*
K_2O_4Os See *Potassium osmate.*
K_2O_4S See *Potassium sulfate.*
$K_2O_5S_2$ See *Potassium metabisulfite.*
$K_2O_6S_2$ See *Potassium dithionate.*
$K_2O_6S_3$ Potassium trithionate, 559[1].
$K_2O_6S_5$ Potassium pentathionate, 559[1].
$K_2O_7P_2Pb$ + $5H_2O$ Potassium plumbopyrophosphate, 2791[1].
$K_2O_8S_2$ See *Potassium persulfate.*
$K_2O_8Se_2Zn$ + $2H_2O$ and $6H_2O$ Potassium zinc selenate, 347[5].
$K_2O_{10}Se_2U$ + H_2O, 3140[1].
K_2S See *Potassium sulfides.*
K_2S_2 See *Potassium sulfides.*
K_2S_4 See *Potassium sulfides.*
K_2S_5 See *Potassium sulfides.*
K_2Se See *Potassium selenides.*
K_2Se_2 See *Potassium selenides.*
K_2Se_3 See *Potassium selenides.*
K_2Se_4 See *Potassium selenides.*
$K_4O_{17}V_6$ + $9H_2O$ Potassium vanadate, 558[1].

LaN_3O_9 Lanthanum nitrate, 2112[6].
LaO_4P, 3658[9].
$La_2Mg_3N_{12}O_{36}$ + $24H_2O$ Lanthanum magnesium nitrate, 1963[9].
$La_2Na_2O_{16}S_4$ + $2H_2O$ Lanthanum sodium sulfate, 346[9], 879[6].
La_2O_3 See *Lanthanum oxide.*
$La_2O_{12}S_3$ See *Lanthanum sulfate.*
$La_2O_{26}S_5U_2$ + $15H_2O$ Lanthanum uranyl sulfate, 558[9].

$LiMnO_4$ See *Lithium permanganate.*
$LiNO_3$ See *Lithium nitrate.*
Li_2O_4S See *Lithium sulfate.*
Li_2O_4U Lithium uranate, 3657[3].
$Li_2O_9P_2U$ Lithium uranylpyrophosphate, 2793[7].
Li_2S_2 See *Lithium sulfides.*
Li_2S_4 See *Lithium sulfides.*
Li_2Se See *Lithium selenides.*
Li_2Se_2 See *Lithium selenides.*
Li_2Se_3 See *Lithium selenides.*
Li_2Se_4 See *Lithium selenides.*
Li_3N See *Lithium nitride.*
Li_3S_2 See *Lithium silicide.*
$Lu_2O_{12}S_3$ Lutecium sulfate, 2112[4].

$MgMoO_4$ + $7H_2O$, 1185[4].
$MgNa_2O_8S_2$ + $4H_2O$ Magnesium sodium sulfate, 3117[2]
MgO See *Magnesia.*
MgO_3S See *Magnesium sulfite.*
MgO_3Si See *Enstatite; Magnesium silicates.*
MgO_4S See *Epsomite; Magnesium sulfate.*
MgO_4U Magnesium uranate, 3657[3].
MgO_6S_2 See *Magnesium dithionate.*
MgS See *Magnesium sulfide.*
$MgSi$ See *Magnesium silicide.*
$MgZn_2$, 894[4], 3125[3]
$Mg_2O_7P_2$ See *Magnesium pyrophosphate.*
Mg_2Pb Magnesium plumbide, 2600[7].
Mg_2Si See *Magnesium silicide.*
Mg_2Sn, 1747[8], 2636[4].
Mg_3N_2 See *Magnesium nitride.*
$Mg_3N_{12}Nd_2O_{36}$ + $24H_2O$ Magnesium neodymium nitrate, 3258[1].
$Mg_3N_{12}O_{36}Pr_2$ + $24H_2O$ Magnesium praseodymium nitrate, 3258[1].
$Mg_3O_8Sb_2$ Magnesium antimonate, 89[7].
Mg_3Sb_2, 2636[4].
MnN_2O_6 See *Manganese nitrate.*
$MnNa_2O_4$ See *Sodium manganate.*
$MnNa_2O_7P_2$ + $4H_2O$ Sodium manganopyrophosphate, 2794[2].
MnO See *Manganese oxides.*
MnO_2 See *Manganese oxides; Pyrolusite.*
MnO_3Si See *Rhodonite.*
MnO_4S See *Manganese sulfate.*
MnO_4U Manganese uranate, 3657[3].
MnS See *Manganese sulfides.*
MnS_2 See *Hauerite.*
$Mn_2O_4Pb_2$ See *Quenselite.*
$Mn_2O_{17}V_6$ Manganese vanadate, 1185[5].
Mn_3O_4 + H_2O See *Hausmannite.*
Mn_3O_6Si Manganese silicate, 2959[9].
$MoNa_2O_4$ See *Sodium molybdate.*
MoO_2 See *Molybdenum oxides.*
MoO_3 See *Molybdenum oxides.*
MoO_4Pb See *Lead molybdate; Wulfenite.*
MoO_4Sr Strontium molybdate, 1157[3].
$MoO_{59}P_2W_{17}$ + $24H_2O$, 3477[6].
Mo_2O_3 See *Molybdenum oxides.*
$Mo_3Na_4O_{16}V_2$ + $10H_2O$ Sodium molybdovanadate, 558[2].
$Mo_3O_{12}Sm_2$ Samarium molybdate, 1157[6], 3658[7].

$NNaO_2$ See *Sodium nitrite.*
$NNaO_3$ See *Sodium nitrate.*
Na_3O_7S + H_2O See *Darapskite.*
O_2 See *Nitrogen oxides.*
Rb Rubidium nitrate, 1647[9].
Th Thorium nitrate, 3656[9].
See *Phosphorus nitride.*
See *Silicon nitride.*
Na_2O_2 Sodium hyponitrite, 1769[3].
O_4 See *Nickel nitrite.*
N_2NiO_6 See *Nickel nitrate.*
N_2O See *Nitrogen oxides.*
N_2O_4 See *Nitrogen oxides.*
N_2O_5 See *Nitrogen oxides.*
N_2O_6Pb See *Lead nitrate.*
N_2O_6Zn See *Zinc nitrate.*
N_2O_8U See *Uranyl nitrate.*
$N_2O_9S_2$ Nitrosylsulfuric acid anhydride, 3142[9].
N_2Ti_2 See *Titanium nitride.*
N_2U_3 See *Uranium nitrides.*
N_3Na Sodium azide, 318[1], 1185[9].
N_3NdO_9 Neodymium nitrate, 2112[4].
N_3O_9Pr Praseodymium nitrate, 2112[4].
N_4Te_3 See *Tellurium nitride.*
N_4U_5 See *Uranium nitrides.*
N_6O_2S Sulfuryl azide, 1081[6].
N_6Sr See *Strontium azide.*
N_6Zn See *Zinc azide.*
$N_{12}Nd_2Ni_3O_{36}$ + $24H_2O$ Neodymium nickel nitrate, 3258[1].
$N_{12}Nd_2O_{36}Zn_3$ + $24H_2O$ Neodymium zinc nitrate, 3258[1].
$N_{12}Ni_3O_{36}Pr_2$ + $24H_2O$ Nickel praseodymium nitrate, 3258[1].
$N_{12}O_{36}Pr_2Zn_3$ + $24H_2O$ Praseodymium zinc nitrate, 3258[1].
NaO_3P See *Sodium metaphosphate.*
NaO_8S_2V Sodium vanadium sulfate, 2626[2].
$NaSn$, 2636[4].
$Na_2Nd_2O_{16}S_4$ + $2H_2O$ Neodymium sodium sulfate, 879[3].
Na_2O_2 See *Sodium oxide.*
Na_2O_2Pb See *Sodium plumbite.*
Na_2O_3S See *Sodium sulfites.*
$Na_2O_3S_2$ See *Sodium thiosulfate.*
Na_2O_4S See *Sodium sulfates.*
$Na_2O_4S_2$ See *Sodium hyposulfite.*
Na_2O_4W See *Sodium tungstate.*
$Na_2O_6S_2$ See *Sodium dithionate.*
$Na_2O_6S_4$ Sodium tetrathionate, 559[1].
$Na_2O_9P_2U$ Sodium uranylpyrophosphate, 2793[7].
Na_2PbS_2 Sodium lead sulfide, 886[1].
Na_2S See *Sodium sulfides.*
Na_2S_2 See *Sodium sulfides.*
Na_2S_2Zn Sodium zinc sulfide, 886[1].
Na_2S_3 See *Sodium sulfides.*
Na_2S_4 See *Sodium sulfides.*
Na_2Se See *Sodium selenides.*
Na_2Se_2 See *Sodium selenides.*
Na_2Se_3 See *Sodium selenides.*
Na_2Se_4 See *Sodium selenides.*
Na_2Sn, 1747[9].
Na_3O_2P See *Sodium hypophosphite.*
Na_3O_4P See *Sodium phosphates.*
$Na_4O_7P_2$ See Sodium pyrophosphates.
$Na_4O_{17}V_6$ + $15H_2O$ Sodium vanadate, 558[1].
$Na_4O_{21}P_6Pb_4$ + $6H_2O$ Sodium plumbopyrophosphate, 2794[2].
$Na_6Nd_4O_{36}S_9$ + $5H_2O$ Neodymium sodium sulfate, 879[3].
$Na_8Nd_8O_{52}S_{18}$ + $6H_2O$ Neodymium sodium sulfate, 879[3].
$Na_{10}Nd_8O_{68}S_{17}$ + H_2O Neodymium sodium sulfate, 879[3].
NdO_4P, 3658[2].
Nd_2O_3 See *Neodymium oxide.*
$Nd_2O_{12}S_3$ See *Neodymium sulfate.*
$Nd_2O_{16}S_4Tl_2$ Neodymium thallium sulfate, 346[5].
$Nd_2O_{34}S_8U_6$ + $15H_2O$ Neodymium uranyl sulfate, 558[6].
$Nd_4O_{60}S_{15}Tl_{18}$ Neodymium thallium sulfate, 346[5].
NiO See *Nickel oxides.*
NiO_2 See *Nickel oxides.*

NiO_4S See *Nickel sulfate.*
NiO_4U Nickel uranate, 3657[3].
$NiO_8Rb_2Se_2$ + $2H_2O$ and $6H_2O$ Nickel rubidium selenate, 347[6].
NiS See *Nickel sulfide.*
NiTe Nickel telluride, 882[1].
Ni_2O_3 See *Nickel oxides.*
$Ni_3O_{17}V_6$ Nickel vanadate, 1185[5].
Ni_3O_4 See *Nickel oxides.*

OP_4 Phosphorous oxide, 1187[5].
OPb See *Lead oxides.*
OPb_2 See *Lead oxides.*
OPd See *Palladium oxides.*
ORh See *Rhodium oxides.*
ORh_2 See *Rhodium oxides.*
OSn See *Tin oxides.*
OSr See *Strontium oxide.*
OZn See *Zincite; Zinc oxide.*
O_2Os See *Osmium oxide.*
O_2Pb See *Lead oxides.*
O_2Pd + H_2O See *Palladium oxides.*
O_2Pr See *Praseodymium oxides.*
O_2Pt See *Platinum oxide.*
O_2Ru See *Ruthenium oxide.*
O_2S See *Sulfur dioxide.*
O_2Si See *Chalcedony; Cristobalite; Opal; Quartz; Silica; Tridymite.*
O_2Sn See *Cassiterite; Tin oxides.*
O_2Te See *Tellurium oxide.*
O_2Th See *Thorium oxide.*
O_2Ti See *Anatase; Rutile; Titanium oxides.*
O_2U See *Uranium oxides.*
O_2V See *Vanadium oxides.*
O_2W See *Tungsten oxides.*
O_2Zr See *Baddeleyite; Zirconium oxides.*
O_3PbS Lead sulfite, 1891[7].
O_3Pr_2 See *Praseodymium oxides.*
O_3Rh_2 See *Rhodium oxides.*
O_3S See *Sulfur trioxide.*
O_3STl_2, 1767[8].
O_3Sb_2 See *Antimony oxides.*
O_3Sc_2 See *Scandium oxide.*
O_3SiTl_2 Thallium silicate, 1962[9].
O_3Tl_2 See *Thallium oxides.*
O_3U See *Becquerelite, Uranium oxides*
O_3V_2 See *Vanadium oxides*
O_3W See *Tungsten oxides.*
O_3W_2 See *Tungsten oxides.*
O_4PPr, 3658[3].
O_4PSm + $2H_2O$ Samarium phosphate, 3658[9].
O_4PYt (See also *Xenotime.*) Yttrium phosphate, 3658[3].
O_4PbS See *Anglesite; Lead sulfate*
O_4PbU Lead uranate, 3657[3].
O_4SSn See *Tin sulfates.*
O_4SSr See *Celestite; Strontium sulfate.*
O_4STl_2 See *Thallium sulfate.*
O_4SV See *Vanadium sulfates.*
O_4SZn See *Zinc sulfate.*
O_4S_2Zn Zinc hyposulfite, 2050[4].
O_4SeU Uranium selenite (basic), 3139[4].
O_4SiTl_4 Thallium orthosilicate, 1962[9].
O_4SiZr See *Hagatalite; Oyamalite; Zircon.*
O_4SrU Strontium uranate, 3657[3].
O_4UZn Zinc uranate, 3657[3].
O_5P_2 See *Phosphorus oxides.*
O_5SSn_2, 1570[8].
O_5Ta_2 See *Tantalum oxides.*
O_5V_2 See *Vanadium oxides.*
O_5W_2 See *Tungsten oxides.*
O_6P_2Sn See *Tin metaphosphate.*
O_6SSn_3, 1570[8]
O_6SU Uranyl sulfate, 1018[6].
O_6S_2Sr + $4H_2O$ See *Strontium dithionate.*
O_6Se_2U Uranium selenite, 3139[4].
O_6SiZn_4 Zinc silicate, 2960[3].
$O_7P_2Sn_2$ See *Tin pyrophosphate.*
O_7SZr_2 + $5H_2O$ Zirconyl sulfate, 2962[8].
O_7SrV_2 See *Strontium vanadate.*
$O_8P_2Sn_3$ See *Tin phosphates.*
O_8Pr_4 + H_2O See *Praseodymium oxides.*
O_8S_2U See *Uranium sulfate.*
O_8S_2Zr + $4H_2O$ Zirconium sulfate, 319[3].
O_8U_3 See *Uranium oxides.*
$O_{11}Pr_6$ See *Praseodymium oxides.*
$O_{11}S_2V_2$ Vanadyl sulfate, 2626[5].
$O_{12}P_2PbU_2$ + $3H_2O$ See *Dewindtite.*
$O_{12}S_2Zr_3$ + $5H_2O$ Zirconyl sulfate, 2962[4].
$O_{12}S_3Sb_2$ See *Antimony sulfate*
$O_{12}S_3Sm_2$ Samarium sulfate, 2112[4]
$O_{12}S_3Tb_2$ Terbium sulfate, 2112[4]
$O_{12}S_3Tm_2$ Thulium sulfate, 2112[4].
$O_{12}S_3Yb_2$ Ytterbium sulfate, 2112[4].
$O_{12}U_3V_2$ Vanadium uranate, 3657[3].
$O_{13}Sr_2V_4$ + $2H_2O$ Strontium vanadate, 1185[6].
$O_{16}P_4Zr_3$ See *Zirconium phosphate*
$O_{16}S_4Tl_4$, 1767[8]
$O_{17}Pb_2U_5$ + $4H_2O$ See *Curite.*
$O_{17}V_6Zn_5$ Zinc vanadate, 1185[5].
$O_{18}S_5Tl_{10}$, 1767[8]
$O_{24}Pr_2S_5U_2$ + $15H_2O$ *Praseodymium uranyl sulfate*, 558[6].
$O_{27}S_7Zr_8$ Zirconyl sulfate, 2962[4].

P_2S_3 See *Phosphorus sulfides.*
PbS See *Galena; Lead sulfides.*
PbSe Clausthalite, 131[3].
PbTe Lead telluride, 882[1].
$Pb_2O_{11}V_4$ + $2H_2O$ Lead vanadate, 1185[6].
PdTe Palladium telluride, 882[1].
$PtTe_2$ Platinum telluride, 882[1].

SSn See *Tin sulfide.*
STl_2 See *Thallium sulfide.*
SZn See *Sphalerite; Wurtzite; Zinc sulfide.*
S_2W See *Tungsten sulfide.*
S_3Sb_2 See *Antimony sulfides; Stibnite.*
S_5Sb_2 See *Antimony sulfides.*
Sb_2O_3 See *Antimony oxides.*
Sb_2O_4, 1569[6].
Sb_2Te_3 Antimony telluride, 882[1]
Sb_2O_5, 1569[6].
SnTe Tin telluride, 882[1].

$TeTl_2$ Thallium telluride, 882[1].
TeZn See *Zinc telluride.*

ABBREVIATIONS USED IN CHEMICAL ABSTRACTS

[α] specific rotation ($[\alpha]^{20}_{D}$, for 20° and sodium light)
abs. absolute
Ac acetyl (AcH, acetaldehyde; AcOH, acetic acid)
a. c alternating current
addn. addition
addnl. additional
alc. alcohol
alk. alkaline (not alkali)
alky. alkalinity
Am amyl
amp. ampere(s)
amt. amount
anhyd. anhydrous
app. apparatus
approx. approximate, approximately
aq. aqueous
assoc. associate(s)
assocd. associated
assocn. association
at. atomic (not atom)
atm. atmosphere(s), atmospheric
at. wt. atomic weight
av. average (except as a verb)
b. (followed by a figure denoting temper- [illegible]ature) boils at, boiling at (similarly
[illegible]nal unit(s)
Bu butyl (normal)
Bz benzoyl (BzH, benzaldehyde; BzOH, benzoic acid)
cal. calorie(s)
calc. calculate
calcd. calculated
calcg. calculating
calcn. calculation
cc. cubic centimeter(s)
c. d. current density
chem. chemical (not chemistry)
cm. centimeter(s)
coeff. coefficient
com. commercial
compd. compound
compn. composition
conc. concentrate
concd. concentrated
concn. concentration
cond. conductivity
const. constant
contg. containing
cor. corrected
c. p. candle power
c. P. chemically pure
crit. critical
cryst. crystalline (not crystallize
crystd. crystallized
crystn. crystallization
cu. m. cubic meter
d. density (d_{13}, specific gravit referred to water at 4°; d^2_2 referred to water at the s perature)
d. c. direct current
decompn. decomposition
deriv. derivative
det. determine
detd. determined
detg. determining
detn. determination
dil. dilute
diln. dilution
dissoc. dissociate(s)
dissocd. dissociated
dissocn. dissociation
distd. distilled
[illegible] distilling
elec. electric, electrical
e. m. f. electromotive force
equil. equilibrium
equiv. equivalent
est. estimate
estd. estimated
estg. estimating
estn. estimation
Et ethyl (Et_2O, ethyl ether)
evap. evaporate
evapd. evaporated
evapg. evaporating
evapn. evaporation
examd. examined
examg. examining
examn. examination
expt. experiment
exptl. experimental
ext. extract
extd. extracted

extg. extracting
extn. extraction
f. p. freezing point
ft. foot, feet
g. gram(s)
h. p. horsepower
hr. hour
in. inch(es)
inorg. inorganic
insol. insoluble
kg. kilogram(s)
kw. kilowatt(s)
l liter(s)
lab. laboratory
lb. pound(s)
m. meter(s); also (followed by a figure denoting temperature) melts at, melting at
manuf. manufacture
math. mathematical
max. maximum
Me methyl (MeOH, methanol
mech. mechanical
mfg. manufacturing
mg. milligram
min. minimum (also minute(s))
mixt. mixture
mol. molecule, molecular
mol. wt. molecular weight
m. p. melting point
n index of refraction (20 to 90° and sodium light)
N normal
neg. negative
no. number
org. organic
p. d. potential difference
pharmacol. pharmacological
phys. physical
physiol. physiological
pos. positive
powd. powdered
p. p. m. parts per million
ppt. precipitate
pptd. precipitated
pptg. precipitating
pptn. precipitation
Pr propyl
prep. prepare
prepd. prepared
prepg. preparing
prepn. preparation
qual. qualitative
quant. quantitative
recrystd. recrystallized
resp. respectively
r. p. m. revolutions per minute
sapon. saponification
sapond. saponified
sapong. saponifying
sat saturate
satd. saturated
satg saturating
satn. saturation
sec. second(s)
sep. separate
sepd. separated
sepg. separating
sepn. separation
sol soluble
soln. solution
soly. solubility
sp specific Ale: Zinc sulfide.
sq. cm. square centimeter(s)
sym. symmetrical
temp. temperature
U. S. P. United States Pharmacopeia
v. volt(s)
vol. volume (not volatile)
w. watt(s)
w. p. c. watts per candle
wt. weight